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QUARTERLY REPORT

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Pittman-Robertson Federal Aid Projects

Volume VI Number 1
January - April 1955

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Helena, Montana
April 15, 1955

Regional Director
Fish and Wildlife Service
P. O. Box 3737
Portland 8, Oregon

Dear Sir:


We are herewith submitting a Quarterly Progress Report in connection with the projects carried out through use of Federal Aid in Wildlife Restoration funds.

The coverage is for the periods October - December, 1954 and January - March, 1955.

Submitted by:


Robert F. Cooney, Coordinator
Wildlife Restoration Division

Approved by:


A. A. O'Claire
State Fish and Game Director



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QUARTERLY PROGRESS REPORT
For The
WILDLIFE RESTORATION DIVISION
STATE OF MONTANA

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Coordinator, Wildlife Restoration Division

- R. F. Cooney

Volume VI Number 1 & 2

October - December, 1954

January - April, 1955

CORRECTION

As no quarterly report was submitted for the last quarter of 1954, this should read Volume V, No. 4 and Volume VI, No. 1 -- instead of Volume VI, Nos. 1 and 2.

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STATE Montana
PROJECT NO. W-49-R-4
DATE April 15, 1955
VOL. VI NO. 1 & 2

Title of Project: Fur Resources Surveys and Investigations

Leader: Fletcher E. Newby

Job Completion Report Job No. I-A Investigations Project

Title of Job: Analysis of the 1953-54 Fur Take

OBJECTIVES:

Determination of the size, value and distribution of the fur take.

TECHNIQUES USED:

Record books of most fur dealers and fur dealer's agents in the state were inspected by biologists and student assistants of the fur resources section. Additional data on the transactions of certain small dealers were obtained from the records of larger fur houses who purchased furs from them. Records of out-of-state sales were obtained from shipping permit records of the Fish and Game Department.

A postal card bearing a printed report form, accompanied by a letter of explanation, was sent to all license holders in the state at the close of the 1953-54 season. Cards were coded prior to distribution to indicate whether they corresponded with a Landowner or General Trapper's License. The trapper's name and address appeared on the card. A space was provided for the trapper to indicate the county or counties in which he trapped.

In the case of fur dealer records, the trapper's address was the only basis for designating the county of capture while the trapper designated the county trapped on his Trapper's Report. In order to make comparisons of fur production in different areas and to minimize the errors present at the county level, the state was divided into eight districts, each including several counties with similar economic and biologic characteristics (Figure 1).

Data from fur dealer records were recorded in numerical code on prepared forms. Coding of Trapper's Report data was done directly on the postal cards. Analysis cards were punched from the coded data and preliminary compilation was subsequently accomplished through use of International Business Machines electric accounting machines.

MONTANA.

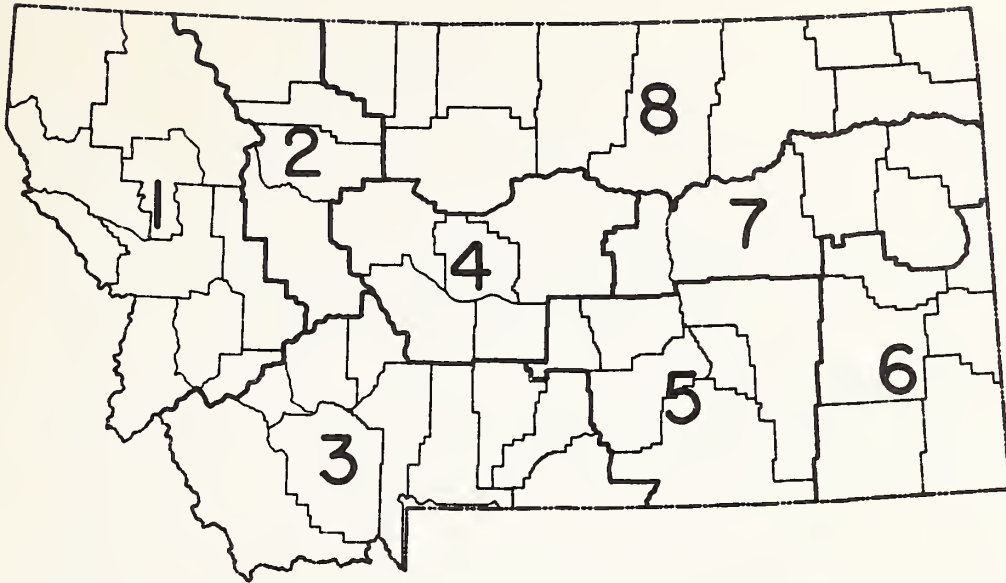


FIGURE 1

FUR DISTRICTS

FINDINGS:

Tabular summaries of the data appear in Tables 1 through 17. Sources of error and limitations of the raw data remain much the same as discussed in previous reports (Newby, 1953, 1954) and will not be restated.

License Type

Two types of trapping licenses are issued -- the Land owner Trapper's (\$1.00, valid only on real estate owned or leased by the holder of license) and the General Trapper's (\$10.00). Additional pelts of all species are taken by unlicensed Indian trappers on reservations throughout the state. Predators may be taken without a license and approximately thirty-nine per cent of all non-Indian sales of predator pelts were made by unlicensed takers.

Land owner trappers comprised 14 to 39 per cent of the active trapper population in the various fur districts while taking 4 to 28 per cent of total number of pelts. General trappers ranged from 61 to 87 per cent of the active trapper population and took from 72 to 96 per cent of the total number of pelts.

Although there were only 3.1 times as many active general trappers as land owner trappers, 9.8 times as many pelts were taken by the general trappers. This situation is probably the result of the general trapper's scope of activity.

Comparison with 1952-53 license sales shows a marked drop in 1953-54 sales of Land owner Trapper's licenses (472 to 369; active trappers 430 to 300) while sales of General Trapper's licenses rose

TABLE 1

TAKE OF 1953-54 TRAPPING SEASON - FUR DISTRICT AND STATEWIDE COMPARISON OF
TRAPPER REPORT AND FUR DEALER RECORD DATA *

Fur District	1		2		3		4		5	
	TR	FD	TR	FD	TR	FD	TR	FD	TR	FD
Mink	2,300	1,853	655	767	2,980	3,275	1,536	1,631	395	451
Muskrat	12,212	9,912	2,779	2,105	9,896	8,325	3,964	2,796	2,348	2,942
Beaver	4,865	4,093	1,117	1,095	4,108	3,711	2,021	1,945	1,767	1,497
Weasel	2,183	258	162	69	511	264	268	211	24	26
Bobcat	239	43	131	56	388	104	125	81	88	61
Skunk	79	13	49	50	599	50	461	360	176	8
Coyote	0	5	5	0	42	4	20	4	28	0
Raccoon	0	0	2	4	90	23	30	1	212	146
Badger	18	2	2	3	57	0	12	1	7	0
Fox	7	1	0	0	2	0	0	1	0	0
Canada Lynx	0	0	0	0	12	0	2	0	0	1
Wolverine	2	0	0	0	2	0	0	0	0	0
Totals	21,905	16,180	4,902	4,149	18,687	15,756	8,439	7,031	5,045	5,132
% State Total	30.6	27.9	6.9	7.2	26.1	27.2	11.8	12.1	7.1	8.8

* Does not include Indian-caught furs.

TABLE 2
OUT-OF-STATE SALES - 1953-54

SPECIES	TOTAL SALES	OUT-OF-STATE SALES	PER CENT OF TOTAL
Mink	9,175	1,572	17.1
Muskrat	31,697	5,686	17.9
Beaver	15,048	645	4.3
Weasel	905	111	12.3
Bobcat	477	21	4.4
Skunk	484	13	2.7
Raccoon	180	54	30.0
Badger	14	3	21.4
Other	17	0	0.0
Totals 1953-54	57,997	8,105	14.0
1952-53	77,886	7,027	9.0
1951-52	65,885	5,816	8.8
1950-51	80,432	8,096	10.1

sharply (809 to 1,067; active trappers 776 to 941). It is believed that this change was largely a result of the fact that a General Trapper's license was prerequisite to obtaining a General Beaver Season permit.

Detailed analysis of the fur take by license type appears in Table 3.

Geographical Distribution of Take

Seventy-five per cent of the total take of furs was produced in 49 per cent of the state's area in Fur Districts 1, 2, 3 and 4. Seventy-seven per cent of the trappers operated in this same area, which includes almost all of the forested, watershed area of the state. Since the most important fur animals -- beaver, mink and muskrat -- are associated with water, it is likely that their distribution in the state is influenced by the fact that seven-tenths of the runoff

TABLE 3

TRAPPER REPORT ANALYSIS -- STATEWIDE

		LANDOWNERS			GENERAL			STATE TOTAL				
No. Trappers		369			1,067			1,436				
No. Reporting Trappers		177			587			764				
% Return		48.0			55.0			53.2				
No. "Did Not Trap" Returns		33			69			102				
Calculated No. Active Trappers		300			941			1,241				
% Total No. Active Trappers		24.2			75.8			100.0				
		No. Pelts Reported	Calculated No. Pelts	% of Total Pelts	No. Pelts Reported	Calculated No. Pelts	% of Total Pelts	No. Pelts Reported	No. Trappers Reporting Each Species	% Reporting Active Trappers	Average catch per Trapper	Calculated Total No. Pelts
Mink		309	618	6.0	4,818	8,760	94.0	5,127	465	70.2	11	9,378
Muskrat		2,148	4,558	10.3	18,800	34,824	89.7	20,948	432	65.3	48	39,382
Beaver		721	1,555	8.2	8,044	14,461	91.8	8,765	384	58.0	23	16,016
Weasel		102	175	5.5	1,760	3,107	94.5	1,862	158	23.9	12	3,282
Bobcat		73	153	12.3	519	944	87.7	592	152	23.0	4	1,097
Skunk		152	319	16.6	764	1,345	83.4	916	104	15.7	9	1,664
Coyote		4	8	7.1	52	96	92.9	56	27	4.1	2	104
Raccoon		39	83	17.2	188	329	82.8	227	38	5.7	6	412
Badger		14	25	17.3	67	123	82.7	81	44	6.6	2	148
Fox		0	0	0.0	7	14	100.0	7	4	0.6	2	14
Canada Lynx		4	10	44.4	5	11	55.6	9	5	0.8	2	21
Wolverine		0	0	0.0	2	4	100.0	2	2	0.3	1	4
Total		3,566	7,504	9.2	35,026	64,018	91.8	38,592				71,522

or stream flow originates on the timbered areas of Montana (Hutchinson and Kemp, 1952).

Other factors which may contribute to the greater number of trappers in western Montana are greater density of the human population (65 per cent of total, 1950 census) and greater winter unemployment. Records provided by the Montana State Employment Service show that during the months of most active trapping -- November, December, March and April -- 74 per cent of all claims for unemployment compensation originate in western Montana.

Fur Prices and Trapper Income

Analysis of sales made during the last two trapping seasons showed that in eastern Montana, average prices for beaver pelts rose from \$7.87 in the 1952-53 season to \$8.41 in the 1953-54 season while in the western portion of the state average prices fell from \$10.23 to \$9.25 (Table 5). Furriers report that new dyeing and tanning processes have reduced the importance of color in grading beaver pelts. Other points of fur quality and size will now play larger parts in determining the price received by the trapper.

Average price data for the various species are presented in Tables 1, 4, 5 and 7 through 16.

Although more trappers were active in 1953-54 than in 1952-53, and muskrat prices declined sharply (Table 5), income rose in most areas (Table 6). This rise was apparently the result of a larger mink take and improved beaver management under the general season which increased the beaver take by more than six thousand pelts.

Mink and Muskrat Seasons

Previous to the 1953-54 season, muskrats received the heaviest trapping pressure as indicated by the high percentage of trappers reporting taking this species. Much less interest was shown in muskrat trapping during the 1953-54 season, apparently due to a marked decline in prices. It appears, instead, that greater effort was expended in the taking of mink.

The 1953 mink trapping season, November 10 through December 31, 1953, applied to all portions of the state and was the same as in previous years. Previous to 1953-54, the muskrat season was March 1 through April 15, statewide. Western Montana continued to have this season. The 1953-54 muskrat season in eastern Montana, however, extended from November 1, 1953 through May 1, 1954.

The influence of season changes and the decline in popularity of muskrat trapping was felt in different portions of the state in varying degree. Indications of this appear in the detailed analyses presented in Tables 7 through 17. Generalized summaries of the situation in the western and eastern portions of the state follow.

TABLE 4
AVERAGE PELT PRICES - DISTRICT AND STATEWIDE
1953-54 SEASON

	1	2	3	4	5	6	7	8	MONTANA
Mink	\$13.70	\$10.75	\$12.25	\$13.46	\$13.76	\$10.10	\$14.15	\$12.44	\$12.88
Muskrat	.65	.56	.62	.55	.53	.57	.42	.50	.59
Beaver	9.38	9.15	9.22	9.03	8.89	7.64	8.47	8.25	9.01

TABLE 5
AVERAGE PELT PRICES -- EAST-WEST COMPARISON

	WESTERN MONTANA			EASTERN MONTANA		
	1952-53	1953-54	Change	1952-53	1953-54	Change
Mink	\$14.14	\$12.88	-\$1.26	\$14.36	\$12.86	-\$1.50
Muskrat	.99	.62	- .37	.80	.51	- .29
Beaver	10.23	9.25	- .98	7.87	8.41	+ .54

TABLE 6
AVERAGE INCOME TO INDIVIDUAL TRAPPER
COMPARISON 1952-53 AND 1953-54 SEASONS
TRAPPER REPORT DATA

	SEASON	1	2	3	4	5	6	7	8	MONTANA
No. Active Trappers	52-53	349	94	315	163	68	29	34	155	1,206
	53-54	353	106	343	155	64	33	37	152	1,241
Income	52-53	\$228	\$204	\$210	\$263	\$239	\$193	\$157	\$153	\$214
	53-54	247	162	260	274	327	185	215	211	244

TABLE 7

MONTHLY DISTRIBUTION OF TRAPPER SALES AND MONTHLY VARIATION IN AVERAGE PRICES
COMPARISON OF 1952-53 AND 1953-54 SEASONS
DISTRICT ONE

MONTH	MINK				MUSKRAT			
	MONTHLY SALES	% OF TOTAL SALES		AVERAGE PRICE	MONTHLY SALES	% OF TOTAL SALES		AVERAGE PRICE
		52-53	53-54			52-53	53-54	
	52-53		53-54		52-53		53-54	
Nov.	112	111	6.0	\$16.41	978	4.5	2.6	\$.94 **
Dec.	904	1,431	77.3	17.33	1,709	7.9	8.6	.69 .57
Jan.	300	201	10.9	13.26	722	3.3	2.3	.95 .54
Feb.	66	23	1.2	7.18	61	0.3	1.4	.80 **
Subt.	1,382	1,766	95.4	16.01	3,470	16.1	14.9	.86 .53
Mar.	71	20	1.1	5.00	6,306	29.2	19.6	1.04 .61
Apr.	94	36	1.9	5.27	8,354	38.7	47.5	1.00 .67
May	40	25	1.3	5.46	2,549	11.8	16.7	1.09 .66
June	7	5	0.3	**	888	4.1	1.3	.96 .63
Subt.	212	86	4.6	5.21	18,097	83.9	85.1	1.03 .66
Total*	1,594	1,852	100.0	14.63	21,567	100.0	100.0	1.01 .65

* Does not include sales from other months or sales without dates, so totals are slightly less than grand totals in other tables.

** Price sample information insufficient for accurate calculation of average price.

TABLE 8

MONTHLY DISTRIBUTION OF TRAPPER SALES AND MONTHLY VARIATION IN AVERAGE PRICES
COMPARISON OF 1952-53 AND 1953-54 SEASONS
DISTRICT TWO

MINK												MUSKRAT					
MONTH	MONTHLY SALES		% OF TOTAL SALES		AVERAGE PRICE		MONTHLY SALES		% OF TOTAL SALES		AVERAGE PRICE						
	52-53	53-54	52-53	53-54	52-53	53-54	52-53	53-54	52-53	53-54	52-53	53-54					
Nov.	127	162	24.3	21.1	\$14.82	\$14.53	99	40	2.5	1.9	\$ **	\$ **					
Dec.	197	323	37.7	42.1	17.15	13.63	1,222	313	31.4	14.9	.97	.56					
Jan.	84	74	16.1	9.6	13.57	11.98	452	152	11.6	7.2	.96	.60					
Feb.	21	26	4.0	3.4	10.81	11.06	230	32	5.9	1.5	.82	**					
Subt.	429	585	82.2	76.3	15.56	13.61	2,003	537	51.4	25.5	.91	.57					
Mar.	24	36	4.6	4.7	6.11	8.13	378	734	9.7	34.9	1.04	.54					
Apr.	49	20	9.4	2.6	5.64	7.08	1,290	567	33.1	26.9	.98	.60					
May	17	124	3.3	16.2	4.47	9.62	189	209	4.9	9.9	.80	.57					
June	3	2	0.6	0.3	**	**	34	58	0.9	2.8	.94	.56					
Subt.	93	182	17.8	23.7	5.50	9.14	1,891	1,568	48.6	74.5	.97	.56					
Total*	522	767	100.0	100.0	13.75	10.75	3,894	2,105	100.0	100.0	.94	.56					

* Does not include sales from other months or sales without dates, so totals are slightly less than grand totals in other tables.

** Price sample insufficient for accurate calculation of average price.

MONTHLY DISTRIBUTION OF TRAPPER SALES AND MONTHLY VARIATION IN AVERAGE PRICES
COMPARISON OF 1952-53 AND 1953-54 SEASONS
DISTRICT THREE

*** Price sample insufficient for accurate calculation of average price.

TABLE 10

MONTHLY DISTRIBUTION OF TRAPPER SALES AND MONTHLY VARIATION IN AVERAGE PRICES
COMPARISON OF 1952-53 AND 1953-54 SEASONS
DISTRICT FOUR

MONTH	MINK					MUSKRAT				
	MONTHLY SALES		% OF TOTAL SALES		AVERAGE PRICE		MONTHLY SALES		% OF TOTAL SALES	
	52-53	53-54	52-53	53-54	52-53	53-54	52-53	53-54	52-53	53-54
Nov.	109	282	8.0	17.3	\$14.96	\$14.07	70	171	1.2	6.1
Dec.	798	877	58.4	53.8	16.27	14.24	1,140	516	19.8	18.5
Jan.	262	325	19.2	19.9	13.65	13.37	287	169	5.0	6.0
Feb.	34	52	2.5	3.2	9.64	9.94	97	46	1.4	1.6
Subt.	1,203	1,536	88.1	94.2	15.43	13.92	1,576	902	27.4	32.3
Mar.	54	28	4.0	1.7	7.10	7.30	1,390	603	24.1	21.6
Apr.	69	42	5.1	2.6	4.71	5.26	2,048	702	35.5	25.1
May	31	22	2.3	1.3	5.38	**	645	508	11.2	18.2
June	9	3	0.7	0.2	5.22	**	102	81	1.8	2.9
Subt.	163	95	11.9	5.8	5.65	6.28	4,185	1,894	72.6	67.7
Total*	1,366	1,631	100.0	100.0	13.90	13.46	5,761	2,796	100.0	100.0
									.92	.55

* Does not include sales from other months or sales without dates, so totals are slightly less than grand totals in other tables.

** Price sample insufficient for accurate calculation of average price.

MONTHLY DISTRIBUTION OF TRAPPER SALES AND MONTHLY VARIATION IN AVERAGE PRICES
COMPARISON OF 1952-53 AND 1953-54 SEASONS
WESTERN MONTANA

* Does not include sales from other months or sales without dates, so totals are slightly less than grand totals in other tables.

TABLE 12

MONTHLY DISTRIBUTION OF TRAPPER SALES AND MONTHLY VARIATION IN AVERAGE PRICES
COMPARISON OF 1952-53 AND 1953-54 SEASONS
DISTRICT FIVE

MONTH	MINK				MUSKRAT			
	MONTHLY SALES		% OF TOTAL SALES		MONTHLY SALES		% OF TOTAL SALES	
	52-53	53-54	52-53	53-54	52-53	53-54	52-53	53-54
			AVERAGE PRICE		AVERAGE PRICE		AVERAGE PRICE	
Nov.	35	90	\$16.65	\$13.78	17	366	0.4	12.4
Dec.	108	270	17.89	14.97	157	476	3.7	16.2
Jan.	38	51	14.64	10.98	665	140	15.7	4.8
Feb.	9	20	**	**	45	481	1.1	16.3
Subt.	190	431	16.47	14.28	884	1,463	20.9	49.7
Mar.	9	4	**	**	1,653	328	39.0	11.1
Apr.	29	10	7.66	6.70	1,363	829	32.1	28.2
May	8	6	**	**	334	305	7.9	10.4
June	0	0	**	**	1	17	0.0	0.6
Subt.	46	20	7.74	7.08	3,351	1,479	79.1	50.3
Total*	236	451	14.53	13.76	4,235	2,942	100.0	100.0
							.88	.53

* Does not include sales from other months or sales without dates; so totals are slightly less than grand totals in other tables.

** Price sample insufficient for accurate calculation of average price.

TABLE 13

MONTHLY DISTRIBUTION OF TRAPPER SALES AND MONTHLY VARIATION IN AVERAGE PRICES
COMPARISON OF 1952-53 AND 1953-54 SEASONS
DISTRICT SIX

MONTH	MINK					MUSKRAT				
	MONTHLY SALES		% OF TOTAL SALES		AVERAGE PRICE	MONTHLY SALES		% OF TOTAL SALES		AVERAGE PRICE
	52-53	53-54	52-53	53-54		52-53	53-54	52-53	53-54	
Nov.	0	0	0.0	0.0	**	0	0	0.0	0.0	**
Dec.	14	61	22.2	61.0	\$18.33	0	19	0.0	38.0	**
Jan.	37	27	58.7	27.0	**	21	11	44.6	22.0	**
Feb.	11	2	17.5	2.0	**	0	0	0.0	0.0	**
Subt.	62	90	98.4	90.0	16.73	21	30	44.6	60.0	**
Mar.	0	7	0.0	7.0	**	0	0	0.0	0.0	**
Apr.	0	3	0.0	3.0	**	26	0	55.4	0.0	**
May	1	0	1.6	0.0	**	0	11	0.0	22.0	**
June	0	0	0.0	0.0	**	0	9	0.0	18.0	**
Subt.	1	10	1.6	10.0	**	26	20	55.4	40.0	**
Total*	63	100	100.0	100.0	16.73	47	50	100.0	100.0	.57

* Does not include sales from other months or sales without dates; so totals are slightly less than grand totals in other tables.

** Price sample insufficient for accurate calculation of average price.

MONTHLY DISTRIBUTION OF TRAPPER SALES AND MONTHLY VARIATION IN AVERAGE PRICES
COMPARISON OF 1952-53 AND 1953-54 SEASONS
DISTRICT SEVEN

****** Price sample insufficient for accurate calculation of average price.

TABLE 15

MONTHLY DISTRIBUTION OF TRAPPER SALES AND MONTHLY VARIATION IN AVERAGE PRICES
COMPARISON OF 1952-53 AND 1953-54 SEASONS
DISTRICT EIGHT

MONTH	MINK				MUSKRAT			
	MONTHLY SALES		% OF TOTAL SALES		AVERAGE PRICE		MONTHLY SALES	
	52-53	53-54	52-53	53-54	52-53	53-54	52-53	53-54
Nov.	72	83	11.5	9.3	\$17.13	\$12.35	959	663
Dec.	293	520	47.0	58.0	15.83	12.34	994	2,452
Jan.	199	207	31.9	23.1	12.40	13.91	922	511
Feb.	17	46	2.7	5.1	**	**	36	350
Subt.	581	856	93.1	95.5	15.06	12.81	2,911	3,976
Mar.	18	17	2.9	1.9	**	9.00	558	117
Apr.	18	15	2.9	1.7	4.44	**	1,587	686
May	6	8	1.0	0.9	**	**	169	190
June	1	0	0.2	0.0	**	**	12	11
Subt.	43	40	6.9	4.5	3.91	6.81	2,326	1,004
Total*	624	896	100.0	100.0	14.13	12.44	5,237	4,980
							100.0	100.0
							75	.50

* Does not include sales from other months or sales without dates; so totals are slightly less than grand totals in other tables.

** Price sample insufficient for accurate calculation of average price.

TABLE 16

MONTHLY DISTRIBUTION OF TRAPPER SALES AND MONTHLY VARIATION IN AVERAGE PRICES
COMPARISON OF 1952-53 AND 1953-54 SEASONS
EASTERN MONTANA

MONTH	MINK				MUSKRAT			
	MONTHLY SALES		% OF TOTAL SALES		AVERAGE PRICE		MONTHLY SALES	
	52-53	53-54	52-53	53-54	52-53	53-54	52-53	53-54
Nov.	110	184	10.0	11.5	\$16.99	\$13.09	976	1,029
Dec.	529	912	48.1	57.0	16.51	13.33	1,238	3,104
Jan.	331	352	30.1	22.0	12.81	13.49	1,665	779
Feb.	38	71	3.5	4.4	9.62	11.75	81	884
Subt.	1,008	1,519	91.6	94.9	15.51	13.30	3,960	5,796
Mar.	27	28	2.5	1.7	5.50	8.00	2,211	524
Apr.	49	28	4.5	1.7	6.41	5.76	3,115	1,515
May	15	26	1.6	1.6	**	5.37	515	543
June	1	0	0.1	0.0	**	**	13	37
Subt.	92	82	8.4	5.1	5.88	6.50	5,854	2,619
Total*	1,100	1,601	100.0	100.0	14.36	12.86	9,814	8,415
							100.0	100.0
							.80	.51
							.87	.56
							.72	.58
							**	.58
							.87	.56
							.80	.51

* Does not include sales from other months or sales without dates; so totals are slightly less than grand totals in other tables.

** Price sample insufficient for accurate calculation of average price.

TABLE 17

THREE YEAR COMPARISON - MINK AND MUSKRAT TRAPPING - TRAPPER REPORT DATA

District	Season	Calculated No. Trappers Taking Each Species		% of Total Active Trappers		Total No. Active Trappers	Average Catch Per Trapper		Total Catch	
		Mink	Muskrat	Mink	Muskrat		Mink	Muskrat	Mink	Muskrat
1	'51-'52	231	253	64.8	70.9	357	7	76	1,543	19,260
	'52-'53	216	296	62.0	84.9	349	7	92	1,511	27,874
	Average	224	275	63.4	77.9	353	7	84	1,527	23,567
	'53-'54	221	232	62.7	65.7	353	10	53	2,300	12,212
	Difference	-3	-43	-0.7	-12.2	0	+3	-31	+773	-11,355
2	'51-'52	44	55	64.1	79.5	70	6	35	273	1,961
	'52-'53	69	82	73.3	86.7	94	10	49	610	3,521
	Average	57	69	68.7	83.1	82	8	42	442	2,741
	'53-'54	80	66	75.9	63.0	106	8	41	655	2,779
	Difference	+23	-3	+7.2	-20.1	+24	0	-1	+213	+38
3	'51-'52	210	261	61.7	76.5	341	9	45	1,961	11,695
	'52-'53	222	260	70.5	82.6	315	8	59	1,707	14,977
	Average	216	261	66.1	79.6	328	9	52	1,834	13,336
	'53-'54	253	238	73.3	69.2	343	12	43	2,980	9,896
	Difference	+37	-23	+7.2	-10.4	+15	+3	-9	+1,146	-3,440
4	'51-'52	112	126	74.1	84.0	151	11	51	1,221	6,463
	'52-'53	136	126	84.8	77.2	163	10	59	1,358	7,318
	Average	124	126	79.5	80.6	157	11	55	1,290	6,891
	'53-'54	128	98	82.2	63.3	155	13	43	1,536	3,964
	Difference	+4	-28	+2.7	-17.3	-2	+2	-12	+246	-2,927
Western Montana	'51-'52	597	695	65.0	75.6	919	8	57	4,998	39,379
	'52-'53	643	764	69.8	83.0	921	8	70	5,186	53,690
	Average	620	730	67.4	79.3	920	8	64	5,092	46,535
	'53-'54	682	634	71.3	66.2	957	11	46	7,471	28,851
	Difference	+62	-96	+3.9	-13.1	+37	+3	-18	+2,379	-17,684

TABLE 17 (Continued)

District	Season	Calculated No. Trappers Taking Each Species		% of Total Active Trappers		Total No. Active Trappers	Average Catch Per Trapper		Total Catch	
		Mink	Muskrat	Mink	Muskrat		Mink	Muskrat	Mink	Muskrat
5	'51-'52	35	56	59.4	93.8	60	8	80	274	4,486
	'52-'53	47	56	69.7	81.8	68	11	69	557	4,090
	Average	41	56	64.6	87.8	64	10	75	416	4,288
	'53-'54	45	53	70.6	82.4	64	9	45	395	2,348
	Difference	+4	-3	+6.0	-5.4	0	-1	-30	-21	-1,940
6	'51-'52	6	2	42.9	14.3	15	3	2	19	4
	'52-'53	21	5	72.2	16.7	29	6	37	129	113
	Average	14	4	57.6	15.5	22	5	20	74	59
	'53-'54	21	11	63.2	31.6	33	4	7	89	72
	Difference	+7	+7	+5.6	+16.1	+11	-1	-13	+15	+13
7	'51-'52	27	17	100.0	64.3	27	3	68	78	1,194
	'52-'53	24	14	70.8	41.7	34	7	38	152	463
	Average	26	16	85.4	53.0	31	5	53	115	829
	'53-'54	23	18	63.0	48.2	37	10	42	238	774
	Difference	-3	+2	-22.4	-4.8	+6	+5	-11	+123	-55
8	'51-'52	85	59	79.6	55.6	107	8	67	692	3,947
	'52-'53	108	112	71.9	75.0	155	8	57	824	6,386
	Average	97	86	75.8	65.3	131	8	62	758	5,167
	'53-'54	105	100	69.2	66.2	152	11	73	1,185	7,337
	Difference	+8	+14	-6.6	+0.9	+21	+3	+11	+427	+2,170
Eastern Montana	'51-'52	153	134	73.2	64.1	209	7	72	1,063	9,631
	'52-'53	200	187	69.9	65.4	286	8	59	1,662	11,052
	Average	177	161	71.6	64.8	248	8	66	1,363	10,342
	'53-'54	194	182	67.8	63.6	286	10	58	1,907	10,531
	Difference	+17	+21	-3.8	-1.2	+38	+2	-8	+544	+189

Western Montana (Fur Districts 1, 2, 3, 4): The number of mink trappers increased 10 per cent over the average of the two previous years; however, an increase in average catch per trapper of more than one-third (from 8 to 11) was probably more significant. This increase in trapping pressure caused the total take to rise 47 per cent over the average take of the two previous seasons.

A considerable change was also noted in the monthly distribution of trapper sales of mink pelts. Spring sales of mink in 1954 (most taken illegally) dropped markedly from the 1953 level, apparently due to less intensive spring muskrat trapping. A notable exception to this general picture occurred in Fur District Two where a 26 per cent increase in spring sales of muskrats was accompanied by a six per cent increase in spring sales of mink. The data in Table 8 also indicate that muskrat trapping did not decline as much in Fur District Two as in the other western districts. This may be due to the presence of several irrigation districts with fall muskrat seasons coincident with the mink season.

The number of muskrat trappers in western Montana in the 1954 season fell 13 per cent from the average of the two previous seasons. In addition, the average catch per trapper dropped 28 per cent (from 64 to 46) on the same comparative basis. The net result was a decline in total take of 38 per cent or 17,684 pelts. Since there were no trapping season changes in this area, the monthly distribution of take remained much the same as in 1952-53 with the exception of Fur District Two as indicated previously.

Eastern Montana (Fur Districts 5, 6, 7, 8): The situation regarding mink trapping was much the same as in the western half of the state. Increases in the number of mink trappers and average catch per trapper raised the total take 40 per cent over the average of the two previous seasons.

As noted previously, the all winter 1953-54 muskrat season in eastern Montana was a considerable change from the spring season of previous years. A number of fall seasons in irrigation districts had, however, produced many fall muskrats as indicated by fall sales totaling 40 per cent of all sales in 1952-53. In spite of this, the season change apparently increased fall sales by nearly 30 per cent. This increase of fall sales was accompanied by a slight increase in fall sales of mink; very marked in the case of Fur District Five with an increase of 15 per cent. It should be noted that the production of Fur Districts Six and Seven is so small as to make analysis for trend indications with data of this type of questionable value.

DISCUSSION:

Because of the substantial increase in the take of a species even previously much sought after, there is cause of concern about the welfare of Montana's mink populations. Since it was recognized that records of an annual take influenced by market and weather conditions do not provide a sufficiently sensitive indication of

population status, an age and sex ratio study of the mink take was instituted a year ago. While conclusions cannot yet be drawn, it is felt that it is well to adopt a somewhat conservative attitude until biological information is available to guide management plans.

As indicated earlier, from 5 to 24 per cent of all mink sales are made during the spring trapping period. Although some of these are hold-overs from the fall period, prices received and correlation with spring muskrat trapping indicate that most are low quality, springy, illegally-taken pelts. While this situation is undesirable at any time, it is especially true when mink are subjected to heavy trapping pressure during the fall period.

Tables 7 through 16 show that prices received for fall-caught muskrats are usually somewhat lower than for spring-taken pelts. The data from eastern Montana (Tables 12 through 16) where trappers could operate from November 1 through May 1 indicate that fall pelts were, however, acceptable to both trappers and fur buyers, since more than twice as many muskrats were sold during the fall period as in the spring period.

Discussion of factors affecting proper setting of muskrat seasons in last year's report (Newby, 1954) led to the conclusion that a season which allowed fall muskrat trapping was the most desirable, particularly from a biological viewpoint. If unfavorable weather conditions or lack of interest should result in an inadequate take in western Montana, a short, properly timed, supplementary spring season would tend to increase the muskrat take without taking many mink. Trappers who previously relied on spring muskrat trapping as a supplementary source of income can now trap beaver under General Beaver Season permit so that the economic structure will be at least maintained if not improved.

RECOMMENDATIONS:

It is recommended that fur dealer record data comparable to those presented here continue to be obtained to aid in evaluation of changes in seasons and to provide average price information for all species.

It is also recommended that the Trapper Report survey be continued for each succeeding season to provide information on the size, distribution and composition of the fur take and the response of trappers to economic conditions.

In view of the data presented affecting proper setting of mink and muskrat seasons, it is recommended that 1954-55 seasons for eastern Montana remain approximately the same as in 1953-54. It is felt, however, that the muskrat season in western Montana should be changed to permit fall trapping. Establishment of a season concurrent with a November-December mink season would appear to be the most practical arrangement. Muskrat trapping during November will be largely regulated by salability of the pelts.

Such arrangement of the mink and muskrat seasons should somewhat restrain further increase in the mink take in western Montana since some trappers will have to divide their interest between the two species during the fall period; furthermore the largely illicit spring take will be almost entirely avoided.

In order to insure an adequate take of muskrats in western Montana, it is recommended that a survey of the fall muskrat take be accomplished during February so that if necessary a short spring season of possibly two weeks' duration may be recommended to the Fish and Game Commission.

SUMMARY:

Furs taken during the 1953-54 season totaled approximately 70,000 pelts worth more than one-quarter million dollars. Three species -- beaver, mink and muskrat -- produced over 90 per cent of the pelts and 98 per cent of the income. The muskrat take fell markedly while the take of both beaver and mink increased considerably.

General trappers took 92 per cent of the pelts, while comprising 76 per cent of the total number of trappers. Sales of Land owner Trapper's licenses dropped considerably while sales of General Trapper's licenses rose sharply.

Seventy-five per cent of the total take of furs was produced in the western half of Montana in Fur Districts 1, 2, 3 and 4.

Although prices for all species declined in varying degree on a statewide basis, prices for beaver in eastern Montana rose from \$7.87 to \$8.41 as a result of new processing techniques. Average income to the individual trapper rose from \$214 to \$244 due to increased take of mink and beaver.

Fourteen per cent of all pelts taken were sold to out-of-state buyers. Seventeen per cent of the mink and 18 per cent of the muskrat pelts were sold outside the state.

Much less interest was shown in muskrat trapping during the 1953-54 season while trapping pressure on mink increased. The muskrat take in western Montana fell 38 per cent while season changes held the catch in eastern Montana near the level of the two previous years.

It is recommended that 1954-55 mink and muskrat seasons for eastern Montana remain approximately the same as in 1953-54. It is felt, however, that the muskrat season in western Montana should be changed to permit fall trapping, possibly concurrent with mink trapping.

LITERATURE CITED:

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Approved by:

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By Wynn G. Freeman, Assistant Director

Wildlife Restoration Division

Date April 15, 1955

STATE	Montana
PROJECT NO.	W-49-R-4
DATE	April 15, 1955
VOL.	VI NO. 1 & 2

Title of Project: Fur Resources Survey and Investigation

Leader: Fletcher E. Newby

Job Completion Report Job No. I-B Investigations Project

Title of Job: Analysis of the 1953-54 Beaver Take

OBJECTIVES:

Determination of the number and distribution of beaver taken on land owner and general season permits.

INTRODUCTION:

As previously reported (Wildlife Restoration Quarterly Report, April - June 1954), Montana's beaver laws were ammended in 1953 to authorize the Fish and Game Commission to set open seasons on beaver.

The consequent General Season was essentially as follows: Every trapper wishing to participate could apply for a permit in any one beaver trapping area as designated on the Montana 1953-54 Trapper Map (see Wildlife Restoration Quarterly Report, April - June 1954 or July - September 1954). A quota for each beaver trapping area was set, and after the deadline of October 1, 1953 the number of applicants for each area was divided into the pertinent quota and thus limits were set for each trapper. A combination permit and record booklet was sent to each trapper. (See Wildlife Restoration Quarterly Report, July - September 1954, Page 15). These record booklets were turned in to the local deputy game warden at the end of the season.

The land owner permit system of trapping beaver on a basis of damage alleviation was continued.

PROCEDURE:

Information from the trappers application form and record booklet was compiled on a standard form. Land owner permit data were likewise compiled. IBM Electric Accounting Machines were used for the preliminary tabulations. For comparative analysis the 1952-53 beaver harvest data were recorded on marginal punch cards and tabulated.

The data were analyzed on the basis of beaver trapping areas. Since these areas, which coincide with deputy game warden districts, can be organized into larger units (coinciding approximately with warden supervisor districts) for clarity and direct application of management recommendations, the data will be presented on the basis of these larger units or 1953-54 Beaver Trapping Districts (Figure 1).

FINDINGS:

Statewide Harvest

The statewide 1953-54 harvest analysis and comparison with the 1952-53 season appears in Table 1. The beaver take increased from 9,940 to 16,097 (1952-53 to 1953-54). The number of beaver permitted (authorized for harvest) increased from 14,674 to 35,835. The number of permits increased from 1,048 to 1,441. Thus the 1953-54 figures constitute 162%, 244% and 138% of the 1952-53 figures for take, number permitted and number of permits, respectively. These percentage figures show number permitted rather than number of permits made the greatest increase.

Utilization of authorized harvest was lower in 1953-54 than in 1952-53. However, in the case of "trapped permits" (those on which one or more beaver were taken), utilization percentages of 80 and 79 are noted for the 1952-53 and the 1953-54 land owner permits respectively.

Of the 629 general season permits issued for the 1953-54 season, only 443 (70%) were used to take one or more beaver. The 1953-54 land owner permits were better utilized, since 617 of the 812 permits (76%) were "trapped". This trend of greater efficiency with the land owner permits is noted throughout the pertinent figures (higher percentage of permitted beaver taken, etc.).

Table 2 shows the average number of beaver taken per permit for 1952-53 and 1953-54. The difference between the two seasons is caused by the significantly high average of the 1953-54 general season permits.

Geographical Distribution of Harvest

Findings concerning harvest distribution, variations between districts and relative district ranks are summarized in Tables 3 - 10.

Districts two and three (two, leading with 3,755 beaver), produced almost half (43%) of the 1953-54 beaver take. Districts one, two, three and four, which make up approximately half of the land area in Montana, took 6,996 beaver or 70% of the total take in 1952-53, and in 1953-54 produced 68% of the harvest or 10,967 beaver. During the 1953-54 season the western half of the state supported 1,024 permits or 71% of the total for the state. Seventy-two percent or 759 of the "trapped permits" were issued for the western half.

MONTANA.

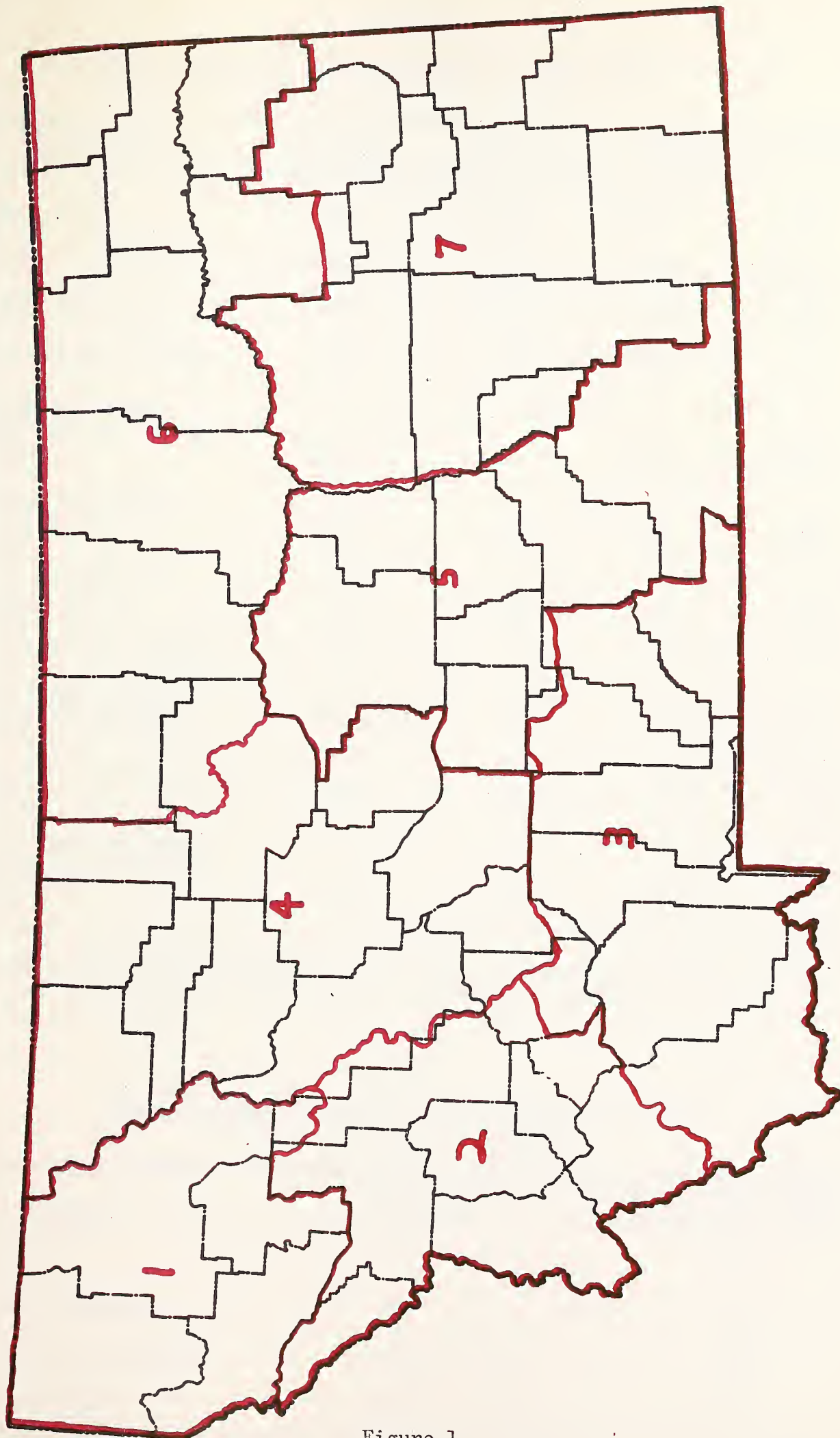


Figure 1

Beaver Trapping Districts

TABLE 1

STATEWIDE COMPARATIVE BEAVER PERMIT AND TAKE ANALYSIS FOR THE
1953-54 AND 1952-53 SEASONS

Permit Type and Year	1953-54 Land owner	1953-54 Gen. Season	1953-54 Total	1952-53
Number Taken	7402	8695	16097	9940
Number Permitted	12055	23780	35835	14674
Number of Permits	812	629	1441	1048
Ave. (\bar{X}) Size Permit	15	39	25	14
Number of Beaver Permitted on Trapped* Permits	9339	16839	26178	12392
Number of Permits Trapped*	617	443	1060	853
Ave. (\bar{X}) Size of Trapped Permit	15	38	25	15
% of Permits Trapped	75.9	70.4	73.5	81.3
% of Permitted Beaver on Trapped Permits	77.4	70.8	73.0	84.4
% of Permitted Beaver Taken	61.4	36.5	44.9	67.7
% of Permitted Beaver on "Trapped Permits" Taken	79.2	51.6	61.4	80.2

* Any beaver permit, general or land owner, on which one or more beaver have been trapped is here noted as a "Trapped Permit."

TABLE 2

AVERAGE NUMBER OF BEAVER TAKEN PER PERMIT FOR THE
1952-53 AND 1953-54 SEASONS

Season	Ave. Number Taken Per Permit	Ave. Number Taken Per Trapped Permit
1952-53	9.5	11.6
1953-54 Land owner	9.1	11.9
1953-54 Gen. Season	13.8	19.6
1953-54 Total	11.2	15.2

TABLE 3

COMPARATIVE BEAVER PERMIT AND TAKE ANALYSIS FOR THE 1953-54 AND 1952-53
SEASONS, AND STATEWIDE STANDING
BEAVER TRAPPING DISTRICT NO. 1

Permit Type and Year	1953-54 Land owner	1953-54 Gen. Season	1953-54 Total	1952-53
Number Taken	664	1029	1693	859
Number Permitted	1031	2283	3314	1293
Number of Permits	90	95	185	116
Ave. (\bar{X}) Size Permit	11	24	18	11
Number of Beaver Permitted on Trapped Permits	816	1532	2348	1012
Number of Permits Trapped	69	67	136	92
Ave. (\bar{X}) Size of Trapped Permit	12	23	17	11
% of Permits Trapped	76.6	70.5	73.5	79.3
% of Permitted Beaver on Trapped Permits	79.1	67.1	70.8	78.2
% of Permitted Beaver Taken	64.4	45.0	51.0	66.4
% of Permitted Beaver on "Trapped Permits" Taken	81.3	67.1	72.1	84.8
STATEWIDE STANDING:				
% of Total Permits	11	16	13	11
% of Total Permits Trapped	11	15	13	11
% of Total Number of Beaver Permitted	9	10	9	9
% of Beaver Permitted on Trapped Permits	9	9	9	8
% of Total Number of Beaver Taken	9	12	11	9

TABLE 4

COMPARATIVE BEAVER PERMIT AND TAKE ANALYSIS FOR THE 1953-54 AND 1952-53
SEASONS, AND STATEWIDE STANDING
BEAVER TRAPPING DISTRICT NO. 2

Permit Type and Year	1953-54 Land Owner	1953-54 Gen. Season	1953-54 Total	1952-53
Number Taken	1880	1875	3755	2287
Number Permitted	3010	3660	6670	2997
Number of Permits	192	157	349	207
Ave. (\bar{X}) Size Permit	16	23	19	14
Number of Beaver Permitted on Trapped Permits	2388	2818	5206	2675
Number of Permits Trapped	152	116	268	179
Ave. (\bar{X}) Size of Trapped Permit	16	24	19	15
% of Permits Trapped	79.1	73.8	76.7	86.4
% of Permitted Beaver on Trapped Permits	79.3	76.9	78.0	89.2
% of Permitted Beaver Taken	62.4	51.2	56.2	76.3
% of Permitted Beaver on "Trapped Permits" Taken	78.7	66.5	72.1	85.4
STATEWIDE STANDING:				
% of Total Permits	24	25	24	20
% of Total Permits Trapped	25	26	25	20
% of Total Number of Beaver Permitted	25	15	19	20
% of Beaver Permitted on Trapped Permits	26	17	20	22
% of Total Number of Beaver Taken	26	22	23	23

TABLE 5

COMPARATIVE BEAVER PERMIT AND TAKE ANALYSIS FOR THE 1953-54 AND 1952-53
SEASONS, AND STATEWIDE STANDING
BEAVER TRAPPING DISTRICT NO. 3

Permit Type and Year	1953-54 Land Owner	1953-54 Gen. Season	1953-54 Total	1952-53
Number Taken	1332	1863	3195	1784
Number Permitted	2039	4068	6107	2506
Number of Permits	134	130	264	185
Ave. (\bar{X}) Size Permit	15	31	23	14
Number of Beaver Permitted on Trapped Permits	1611	2848	4459	2248
Number of Permits Trapped	100	89	189	160
Ave. (\bar{X}) Size of Trapped Permit	16	32	24	14
% of Permits Trapped	74.6	68.4	71.5	86.4
% of Permitted Beaver on Trapped Permits	79.0	70.0	73.0	89.7
% of Permitted Beaver Taken	65.3	45.7	52.3	71.1
% of Permitted Beaver on "Trapped Permits" Taken	82.6	65.4	71.6	79.3
STATEWIDE STANDING:				
% of Total Permits	16	21	18	18
% of Total Permits Trapped	16	20	18	19
% of Total Number of Beaver Permitted	17	17	17	17
% of Beaver Permitted on Trapped Permits	17	17	17	18
% of Total Number of Beaver Taken	18	21	20	18

TABLE 6

COMPARATIVE BEAVER PERMIT AND TAKE ANALYSIS FOR THE 1953-54 AND 1952-53
SEASONS, AND STATEWIDE STANDING
BEAVER TRAPPING DISTRICT NO. 4

Permit Type and Year	1953-54 Land Owner	1953-54 Gen. Season	1953-54 Total	1952-53
Number Taken	1416	888	2304	2066
Number Permitted	2472	2448	4920	3296
Number of Permits	154	72	226	209
Ave. (\bar{X}) Size Permit	16	34	22	16
Number of Beaver Permitted on Trapped Permits	1889	1753	3642	2752
Number of Permits Trapped	115	51	166	169
Ave. (\bar{X}) Size of Trapped Permit	16	34	22	16
% of Permits Trapped	74.6	70.8	73.4	80.8
% of Permitted Beaver on Trapped Permits	76.4	71.6	74.0	83.4
% of Permitted Beaver Taken	57.2	36.2	46.8	62.6
% of Permitted Beaver on "Trapped Permits" Taken	74.9	50.6	63.2	75.0
STATEWIDE STANDING:				
% of Total Permits	19	12	16	20
% of Total Permits Trapped	19	12	16	20
% of Total Number of Beaver Permitted	21	10	14	22
% of Beaver Permitted on Trapped Permits	20	10	14	22
% of Total Number of Beaver Taken	19	10	14	21

TABLE 7

COMPARATIVE BEAVER PERMIT AND TAKE ANALYSIS FOR THE 1953-54 AND 1952-53
SEASONS, AND STATEWIDE STANDING
BEAVER TRAPPING DISTRICT NO. 5

Permit Type and Year	1953-54 Land Owner	1953-54 Gen. Season	1953-54 Total	1952-53
Number Taken	1129	1166	2295	1232
Number Permitted	1727	2737	4464	1848
Number of Permits	128	56	184	144
Ave. (\bar{X}) Size Permit	13	49	24	13
Number of Beaver Permitted on Trapped Permits	1395	2168	3563	1460
Number of Permits Trapped	105	43	148	109
Ave. (\bar{X}) Size of Trapped Permits	13	50	24	13
% of Permits Trapped	82.0	76.7	80.4	75.6
% of Permitted Beaver on Trapped Permits	80.7	79.2	79.8	79.0
% of Permitted Beaver Taken	65.3	42.6	51.4	66.6
% of Permitted Beaver on "Trapped Permits" Taken	80.9	53.7	64.4	84.3
STATEWIDE STANDING:				
% of Total Permits	16	8	13	14
% of Total Permits Trapped	17	10	14	13
% of Total Number of Beaver Permitted	14	12	12	13
% of Beaver Permitted on Trapped Permits	15	13	13	12
% of Total Number of Beaver Taken	15	14	14	12

TABLE 8

COMPARATIVE BEAVER PERMIT AND TAKE ANALYSIS FOR THE 1953-54 AND 1952-53
SEASONS, AND STATEWIDE STANDING
BEAVER TRAPPING DISTRICT NO. 6

Permit Type and Year	1953-54 Land Owner	1953-54 Gen. Season	1953-54 Total	1952-53
Number Taken	529	1073	16-2	897
Number Permitted	1027	4809	5836	1602
Number of Permits	65	89	154	100
Ave. (\bar{X}) Size Permit	16	54	38	16
Number of Beaver Permitted on Trapped Permits	658	2935	3593	1279
Number of Permits Trapped	38	55	93	73
Ave. (\bar{X}) Size of Trapped Permits	17	53	39	18
% of Permits Trapped	58.4	61.7	60.3	73.0
% of Permitted Beaver on Trapped Permits	64.0	61.0	61.5	79.8
% of Permitted Beaver Taken	51.5	22.3	27.4	55.9
% of Permitted Beaver on "Trapped Permits" Taken	80.3	36.5	44.5	70.1
STATEWIDE STANDING:				
% of Total Permits	8	14	11	10
% of Total Permits Trapped	6	12	9	9
% of Total Number of Beaver Permitted	8	20	16	11
% of Beaver Permitted on Trapped Permits	7	17	14	10
% of Total Number of Beaver Taken	7	12	10	9

TABLE 9

COMPARATIVE BEAVER PERMIT AND TAKE ANALYSIS FOR THE 1953-54 AND 1952-53
SEASONS, AND STATEWIDE STANDING
BEAVER TRAPPING DISTRICT NO. 7

Permit Type and Year	1953-54 Land Owner	1953-54 Gen. Season	1953-54 Total	1952-53
Number Taken	452	801	1253	815
Number Permitted	749	3775	4524	1132
Number of Permits	49	30	79	87
Ave. (\bar{X}) Size Permit	15	126	57	13
Number of Beaver Permitted on Trapped Permits	582	2785	3367	966
Number of Permits Trapped	38	22	60	71
Ave. (\bar{X}) Size of Trapped Permits	15	127	56	14
% of Permits Trapped	77.5	73.3	75.9	81.6
% of Permitted Beaver on Trapped Permits	77.7	73.7	74.4	85.3
% of Permitted Beaver Taken	60.3	21.2	27.6	72.0
% of Permitted Beaver on "Trapped Permits" Taken	77.6	28.7	37.2	84.3
STATEWIDE STANDING:				
% of Total Permits	6	4	5	8
% of Total Permits Trapped	6	5	5	8
% of Total Number of Beaver Permitted	6	16	13	8
% of Beaver Permitted on Trapped Permits	6	17	13	8
% of Total Number of Beaver Taken	6	9	8	8

TABLE 10

COMPARATIVE STATEWIDE RANK FOR THE SEVEN BEAVER TRAPPING DISTRICTS
IN THE 1953-54 AND 1952-53 BEAVER HARVESTS

Beaver Trapping Districts	1	2	3	4	5	6	7
1952-53							
Beaver Taken	5	1	3	2	4	6	7
Number of Permits	5	2	3	1	4	6	7
Number of Trapped Permits	5	1	3	2	4	6	7
Number of Beaver Permitted	6	2	3	1	4	5	7
Number of Beaver Permitted on Trapped Permits	6	2	3	1	4	5	7
1953-54							
Beaver Taken	5	1	2	3	4	6	7
Number of Permits	4	1	2	3	5	6	7
Number of Trapped Permits	5	1	2	3	4	6	7
Number of Beaver Permitted	7	1	2	4	6	3	5
Number of Beaver Permitted on Trapped Permits	7	1	2	3	5	4	6

A relatively constant ratio between the increase in beaver permitted (or authorized) for the 1953-54 season over the 1952-53 season, and the respective increase in harvest was apparent for districts one, two, three, four and five (Table 11). Apparently the increase in permitted beaver in these areas was approximately 1.3 times the increase in harvest. In districts six and seven the ratio was 2.0 and 2.5 respectively.

Trapping On Private and Public Lands

Although the land owner permits decreased from 1048 in 1952-53 to 812 in 1953-54, the general season record booklets contained 1110 land owner signatures authorizing general season trapping on private land (see Figure 2).

TABLE 11

RELATIONSHIP BETWEEN INCREASE IN PERMITTED BEAVER
(1953-54 OVER 1952-53) AND INCREASE IN HARVEST

Beaver Trapping District	1	2	3	4	5	6	7
% of 1952-53 Season Permitted in 1953-54 Season	256	222	243	149	241	364	400
% of 1952-53 Season Harvest in 1953-54 Season	197	164	178	112	186	179	154
Index: Increase in Permitted Beaver/Increase in Harvest	1.30	1.35	1.36	1.34	1.30	2.04	2.50

PERMISSION TO TRAP ON PRIVATE PROPERTY

The bearer has my permission to trap beavers during the 1953-54 General Beaver Season on my property (owned or leased) herein described:

Description	Owners (or Lessee's) Signature
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Figure 2. Form included in Report Booklet for use of trappers trapping on private land. (Permission of land owner or leasee was necessary to trap private land.)

Of the "trapped" general season permits, 325 authorized private land trapping. The remaining 118 were used on public land only. Districts one, two and three respectively, contained 31%, 28% and

16% of the latter permits (Table 12).

TABLE 12

DISTRIBUTION OF "TRAPPED" PERMITS ISSUED FOR PUBLIC LAND ONLY

Beaver Trapping District	1	2	3	4	5	6	7	Total
Number of Permits	36	33	19	13	5	11	1	118
% of Total	31	28	16	11	4	9	1	

Age of General Season Beaver Trappers

Four hundred and ninty-eight general season trappers volunteered their ages (space provided on application forms). Table 13 gives the number of trappers, beaver harvest and average catch by age class. Although the 30-39 and 40-49 age classes were almost equally represented, the older class took the highest percentage of the total catch, and made the highest average catch.

TABLE 13

NUMBER OF TRAPPERS*, BEAVER HARVEST AND AVERAGE CATCH BY AGE CLASS OF TRAPPERS

Age Classes	No.	% of Total No.	Take	% of Total Take	Ave. Take
12 - 19	30	6	478	6	15.9
20 - 29	61	12	864	11	14.1
30 - 39	111	22	1838	22	16.5
40 - 49	115	23	2112	26	18.3
50 - 59	90	18	1560	19	17.3
60 - 69	71	14	1053	13	14.8
70 -	20	4	252	3	12.6
Total	498		8157		16.3

* All trappers did not report age.

DISCUSSION AND CONCLUSIONS:

Harvest

The primary purpose of the 1953-54 general beaver season was to increase the beaver harvest. The harvest was significantly increased.

The increase in authorized harvest (number of beaver permitted), provided through general season permits, was much greater than the increase in number of permits. The average size of the 1953-54 land owner permits did not vary significantly from the 1952-53 permits. The general season permits were significantly larger. Thus, the findings indicate the harvest increase probably was highly influenced by the large increase in authorized harvest made possible through the larger permits of the general season.

Pelt value changed very little from 1952-53 (Wildlife Restoration Quarterly Report October - December 1954).

Authorized Harvest Utilization

The utilization of authorized harvest was considerably higher for land owner permits than for general beaver season permits. A possible factor behind this was the difference in beaver royalty payment procedure between the two systems. The land owner permittee paid \$10 for a permit plus \$1 for every beaver allowed over 10. This investment could not be refunded. The general season permit holder paid \$1 royalty for each beaver actually caught, and did not have this investment to lose. Thus, if only land owner permits of 1953-54 are compared to the permits (all land owner) of 1952-53, this possible cause of variation is eliminated.

The 1952-53 season was more efficient than the land owner segment of the 1953-54 season. However, considering only "trapped" permits (those on which one or more beaver were taken), the utilization of authorized harvest was practically the same. Thus, the lower percentage of "trapped" permits rather than the lower percentage of authorized beaver harvested, is apparently responsible for the difference in efficiency.

These findings suggest a reduction in availability of trappers rather than in the availability of beaver was the cause for a decrease in efficiency from 1952-53 to 1953-54. This is substantiated by the rise in average number of beaver taken from 1952-53 to 1953-54, indicating better trapping success. Further substantiation is indicated by Newby (1954), who notes that two-thirds of the 1952-53 beaver take was made by trappers holding a General Trapper's License (land owner permits may be trapped by the permittee or by a general licensed trapper of the permittee's designation), and by the fact that most of these same trappers were issued general season permits in 1953-54, thus perhaps, becoming too busy to do all of the available land owner trapping.

Distribution of Harvest

Distribution of the beaver harvest was not significantly changed from 1952-53. Changes in the distribution of permits were few, and mostly favored the western part of the state. Thus, the problem of relatively high beaver density and low trapping pressure in the eastern part of the state (previously pointed out in the 1953 aerial beaver colony count report) was not solved. District one increased from 9% of the take in 1952-53 to 10% in 1953-54, district two remained the same with a state-high of 23%, three increased from 18% to 20%, four showed a marked decrease from 21% to 14%, five increased its share from 12% to 14%, six showed some increase, 9% to 10%, and seven remained the same at 8% of the total state harvest. Districts five, six and seven changed very little in rank concerning take and number of permits. The attempt to draw trappers east with large quotas was reflected in the rank changes concerning numbers permitted. Apparently little change in the distribution of take between 1952-53 and 1953-54 is suggested by the data.

The relationship of authorized harvest increase (of the 1953-54 season over the 1952-53 season) to harvest increase is perhaps indicative of similarities between western districts. Since district four, showing the only major deviation from previous harvest distribution (a relatively low harvest), maintained the same ratio (1.3) of increased authorized harvest to increased harvest as the other western districts, the cause for this deviation would appear to be an insufficient increase in authorized harvest.

Trapping on Private and Public Lands

Findings indicate that although the number of land owner permits dropped substantially, probably a greater amount of private land was trapped in 1953-54 than in 1952-53. Since each land owner permit must be determined on the basis of a personal inspection of the property by the local game warden, trapping private property by general season permit saves time and thus money for the Fish and Game Department. Since inspections dropped by at least 236 (the drop in land owner permits) from 1952-53 to 1953-54, a saving is indicated for the 1953-54 season.

Most of Montana's public beaver habitat is in the west with the majority of the National Forests. This was reflected in the distribution of permits trapped only on public land. Thus, the problem of inadequate harvest in the eastern end of the state primarily concerns private lands.

Trapper Age

The 40 - 49 age class of beaver trappers was the most important in the 1953-54 general season. This group made the highest average catch, took the most beaver, and represented more trappers

than any other group.

The age distribution indicated considerably over half of the trappers were under fifty years old, and nearly half were under forty. Obviously, the bulk of the beaver trappers are not old men.

RECOMMENDATIONS:

The present system of beaver management should be continued.

More lenient regulations concerning size of permits may help increase the harvest in the eastern part of the state, and should be considered.

Since the data do not indicate poor success in the west, those areas should be harvested at the present level of intensity or possibly higher for at least another year. These western areas, however, according to colony count and age ratio figures are not as heavily populated as in the east, and thus may be the first areas to react to relatively heavy harvests, such as indicated in this report. Reactions, such as increased production, should be expected and properly analyzed.

Since the findings indicate that general season permits are less expensive to administer and have a higher success per permit, it is recommended that these permits be used as much as feasible in the place of land owner permits.

The 1954-55 beaver season should be analyzed for comparison with this report. IBM systems should be used to greatest advantage in future harvest reports.

SUMMARY:

The statewide 1953-54 beaver harvest was 16,097. This was a significant increase over the previous season's take of 9,940. Findings indicate the large increase in authorized harvest, made possible through the larger permits of the general beaver season, was the primary factor in this increase.

Analysis of authorized harvest utilization, suggested a reduction in availability of trappers rather than in availability of beaver was the cause for a decrease in efficiency from the 1952-53 season.

Distribution of harvest remained relatively unchanged from the previous season. The problem of a high beaver density and a low trapping pressure in the eastern half of the state was not solved.

The only significant change in harvest distribution rank among the seven districts was found in district four where the percentage of statewide harvest dropped from 21 to 14. This drop was found to be caused by an insufficient increase in authorized harvest.

Due to 1,110 land owner signatures in the general season report booklets, more private land was probably trapped in 1953-54 than in 1952-53. Since the land owner permits dropped from 1,048 to 812, and, since general season permits do not require an expensive property inspection, it was concluded that a saving to the department was possibly incurred.

Most of the general season permits which were utilized exclusively on public lands were issued in the western districts.

The most important age class of trappers was the 40 - 49 year old group. Age distribution indicated considerably over half of the trappers were under fifty years old, and nearly half were under forty.

Recommendations were to keep the present management system, to be more lenient with regulations concerning the eastern half of the state, to expect and properly analyze biological reactions to the relatively heavy harvests in the west, to continue the present intensity of harvest in the west for at least one more year, and to analyze the 1954-55 beaver season to obtain information comparable to that in this report. The less expensive but more successful general season permit was recommended for use, as much as feasible, in the place of land owner permits. The use of IBM Electric Accounting Machines in the tabulation of harvest data is emphasized.

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Submitted by:

Name Joe Townsend

Date January 15, 1955

Approved by:

Name Fletcher Newby

Approved by:

Montana State Department of Fish and Game

By Wynn G. Freeman, Assistant Director

Wildlife Restoration Division

STATE	Montana	
PROJECT NO.	W-49-R-4	
DATE	April 15, 1955	
VOL.	VI	NO. 1 & 2

Title of Project: Fur Resources Survey and Investigation

Leader: Fletcher E. Newby

Job Completion Report Job No. II-F Investigations Project

Title of Job: Muskrat Population Trends

OBJECTIVES:

To obtain index figures, relating to fluctuations in muskrat populations, for guidance in management procedures.

TECHNIQUES USED:

Ground house counts were made on selected study areas.

FINDINGS:

House counts of seven study areas in Flathead County showed three areas to have increased house numbers over the previous year, while remaining areas decreased (Table I). Counts were initiated on one waterfowl development area (Freezout and Priest Lakes).

DISCUSSION:

On the basis of limited study areas and initial data, it is difficult to observe any significance from the above data. With the advent of district management biologists and inventories of muskrat-waterfowl areas, records will be available for house counts in the important muskrat producing areas of the State.

TABLE I
GROUND HOUSE COUNTS

Location	1953	1954
McWiniger Slough	9	18
Small Slough	48	50
McCormic Slough	14	17
Wiley's Slough	11	7
Smith Lake	6	5

TABLE I (Continued)

Location	1953	1954
North Blasdell Slough	9	6
South Blasdell Slough	45	30
Freezout Lake	--	13
Priest Lake	--	48

CONCLUSIONS:

Present study areas confine recommendations to one county only. A statewide scattering of trend areas will supply required and significant information of muskrat population status. This information is also important for support of recommendations for mink seasons.

RECOMMENDATIONS:

Areas should be established in all districts of the state to supply a reliable indication of population fluctuations. Recommendations will be based upon these data for the open seasons of immediate localities.

SUMMARY:

Ground muskrat house counts were continued for seven study areas in one county. Three areas showed an increase over previous year's count while the remaining areas decreased. House counts were initiated for one waterfowl development area.

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Montana State Fish and Game DepartmentBy Wynn G. Freeman, Ass't CoordinatorWildlife Restoration Division

STATE	Montana
PROJECT NO.	W-49-R-4
DATE	April 15, 1955
VOL.	VI NO. 1 & 2

Title of Project: Fur Resources Survey and Investigation

Leader: Fletcher E. Newby

Job Completion Report

Job No. II-G

Investigations Project

Title of Job: Marten Population Status

OBJECTIVES:

To determine distribution and population status of marten.

INTRODUCTION:

Management of Montana's marten populations has been an erratic matter. During the past ten years there have been only three open seasons: 1946, 1950 and 1951. It is believed that under more intensive management Montana's potential production of marten may be several times this present low level. Accordingly, analysis of the results of the 1950 and 1951 marten seasons was undertaken to aid in the development of an improved management plan. Trapper activity and success was evaluated to provide information on the distribution and status of trappable marten populations in various areas of western Montana.

It has been recognized for some time that areas were present in Montana which provided opportunities for restoration of marten through restocking activities. It was decided to incorporate in the present study preliminary investigation of possible transplant sites and sources of transplant stock.

TECHNIQUES USED:

Montana Fish and Game Law provides that a trapper taking marten must complete an affidavit giving his name, residence, license number, date and place of capture, and number of marten taken, in order to obtain tags which legalize sale of the pelts. Tags must be obtained within 20 days of the closing of an open season. Locations of most catches of marten were plotted on maps with reasonable accuracy, although in some cases the information provided was inadequate.

Delineation of habitat units shown in Figures 1 through 4 was based on a generalized map of vegetation types of the state (author unknown) and elevation. All large areas of spruce-alpine fir (Picea spp.-Abies lasiocarpa) were contained in these units. In addition, the higher areas of larch-Douglas fir (Larix-Pseudotsuga) in northwestern Montana and lodgepole-Douglas fir (Pinus contorta-Pseudotsuga) in other areas were included.

Field investigation largely involved observations of scat abundance on trails and live trapping in selected areas. Some use was made of small mammal snap-trap lines to obtain indications of species composition and relative abundance. Aerial reconnaissance of selected areas was conducted to provide information on general timber type distribution, especially in proposed transplant sites.

FINDINGS:

Distribution and size of catches in northwestern Montana can be seen in Figure 1; southwestern Montana in Figure 3. Each symbol indicates the general locality of capture. Although some trappers operated in two or more localities, with representation by two or more symbols, for the most part the activity of a trapper is indicated by one symbol. Locations of the important units of marten habitat are found in Figures 1 through 4. Major groupings of habitat units or "sections" are outlined in Figures 2 and 4. Tabular summaries of data derived from analysis of marten tagging records are found in Tables 2 and 3.

Other findings are incorporated in the following discussion.

DISCUSSION:

Marten Habitat

Examination of Figures 1 through 4 shows that the major areas of marten habitat and trapping activity fall more or less naturally into four sections. The sections appearing in Figures 1 and 2 might be termed the Whitefish section and the northern Continental section. The Whitefish section consists of the Whitefish and Galton or Wigwam Ranges. The northern Continental section consists primarily of the mountain ranges in the drainage areas of the Swan, South and Middle Forks of the Flathead, and Sun Rivers.

There are a number of additional habitat units shown in Figures 1 and 2 which are not included in the two major groupings described. Most of these are relatively small. All were either untrapped or lightly trapped. Two units, indicated in Figure 2, received preliminary investigation as transplant sites. A plant of seven marten for pilot study purposes was made in one

DISTRIBUTION OF MARTEN TAKE

- 1950 CAPTURES
- 1951 CAPTURES
- ⊗ 1950 EXACT LOCATION UNKNOWN
- ⊗ 1951 EXACT LOCATION UNKNOWN
- BOUNDARY OF HABITAT UNIT

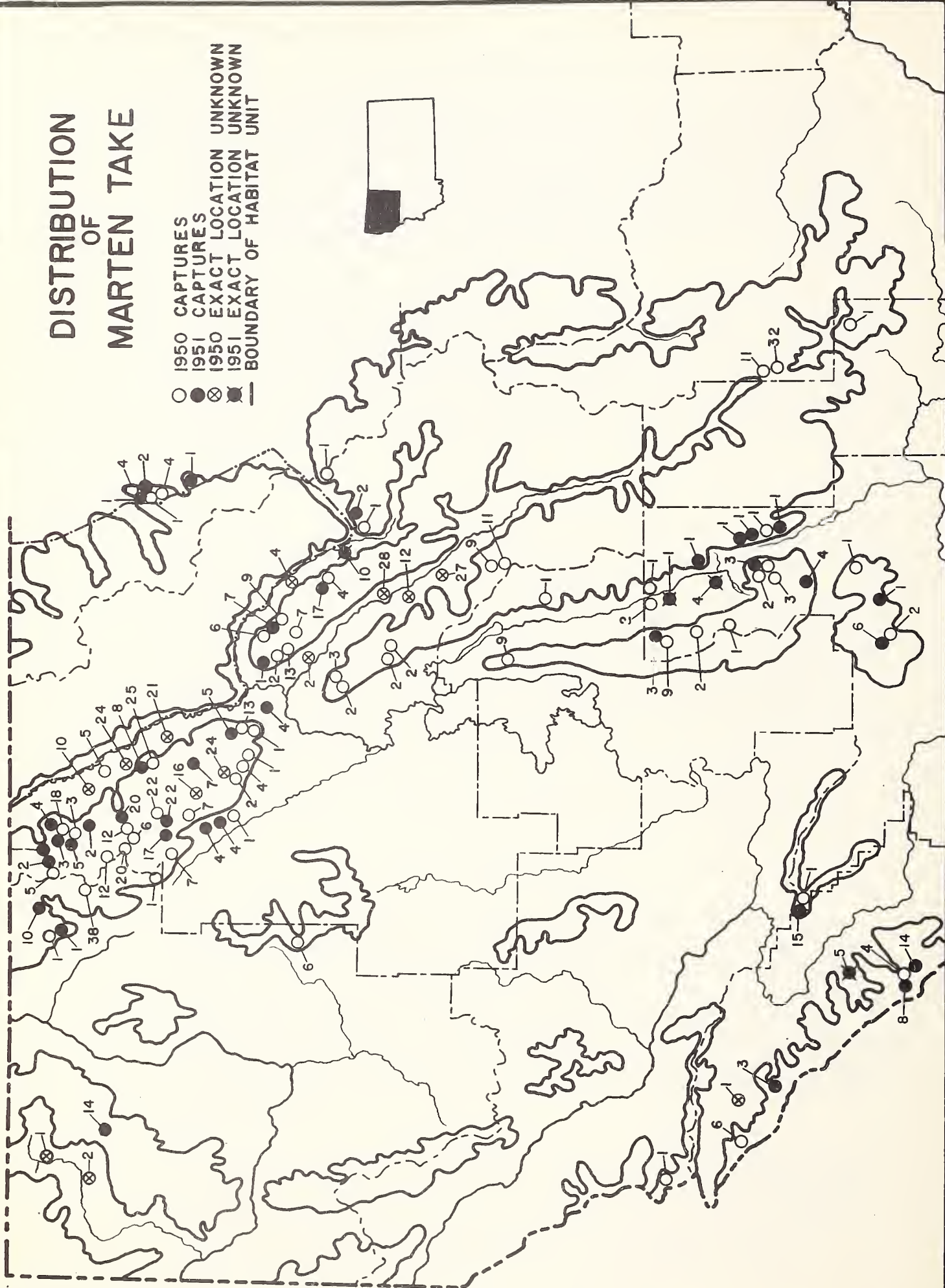


Figure 1

DISTRIBUTION OF MARTEN HABITAT

- BOUNDARY OF HABITAT UNIT
- - - BOUNDARY OF MAJOR HABITAT SECTION
- ▨ UNDER INVESTIGATION FOR RESTOCKING
- ⊕ SITE OF PILOT STUDY PLANT
- ⊕ SOURCE AREAS FOR TRANSPLANT STOCK

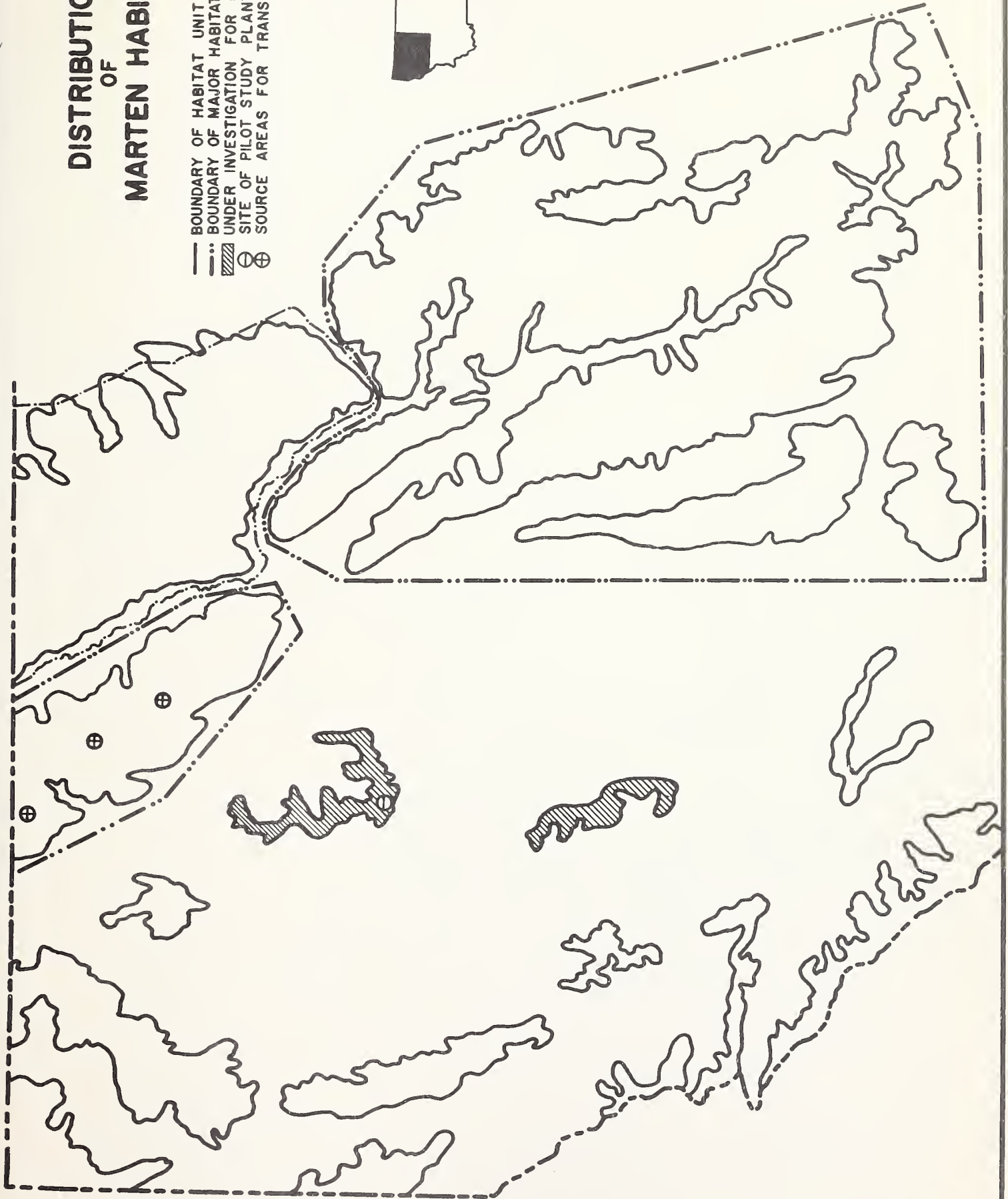


Figure 2

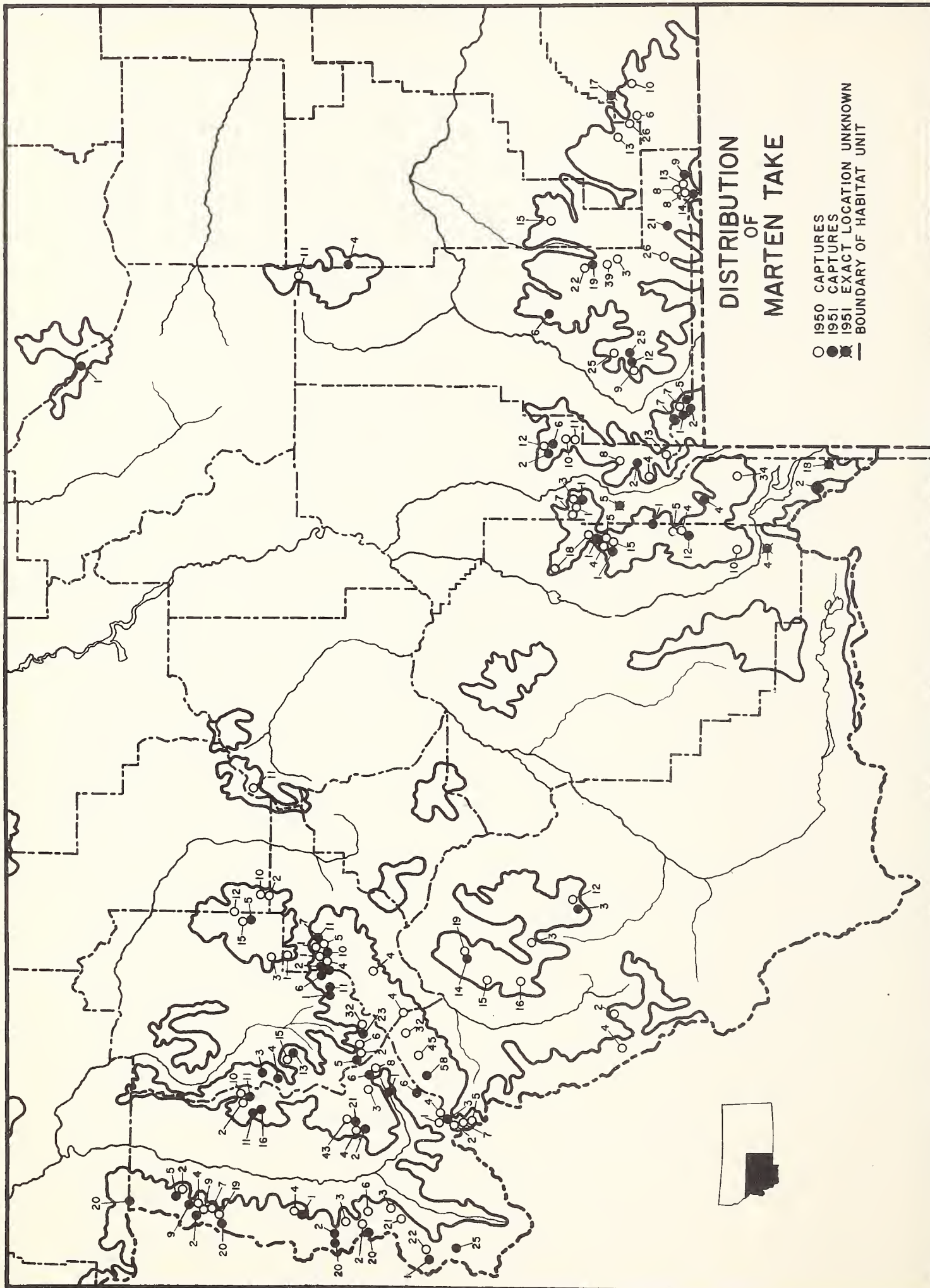


Figure 3



Figure 4

of these areas as shown in Figure 2.

The major groupings of habitat units and trapping activity shown in Figure 3 and outlined in Figure 4 could be termed the southern Continental section and the Yellowstone section. The southern Continental section contains the Bitterroot Range, north to Lolo Pass; the Sapphire, Pintlar, Flint Creek and Pioneer Ranges; and the Big Hole Divide or Beaverhead Mountains south of Lemhi Pass. The Yellowstone section consists of all habitat units adjacent to the northern and western boundaries of Yellowstone National Park.

All the habitat units outside the four major sections should eventually receive field investigation to determine whether underutilization of existing populations or lack of marten is the reason for the low level of production. It is known that some offer opportunities for restoration through restocking.

It is recognized that the habitat units as depicted in Figures 1 through 4 include many areas which are not marten habitat. Rocky, barren areas and cliffs, the alpine zone above timberline, burned areas and inclusions of unsuitable timber types are examples of such areas. Revision of habitat unit boundaries will result in greater accuracy as field investigation progresses.

The nature of marten habitat changes considerably as one progresses from north to south in Montana. Heavier precipitation in northwestern Montana results in greater forest development. In addition, species occupying moist sites such as Engelmann spruce constitute a greater percentage of the total forest composition. By contrast, southwestern Montana forests are more open and dry. As a result, tree species suited to lower rainfall compose proportionately more of the total forest cover.

In southwestern Montana the lower margin of marten habitat is at least 3,000 feet higher than in the north. The approximate range of habitat in the Whitefish Range and Glacier National Park is from 3,500 to 7,000 feet, while the corresponding range in the Yellowstone region is about 7,000 to 10,000 feet. There is, of course, much local variation.

Table 1 presents the percentage composition of total forest cover and altitudinal range of Engelmann spruce and lodgepole pine in an effort to demonstrate elevational and vegetational changes in the character of marten habitat from north to south.

It is felt that much of the marten range present at the time of arrival of the first white men in Montana is still suitable for occupancy by marten. It is true that fires and logging have depleted the habitat in many local areas, but it is only recently that logging operations have involved much marten habitat. Furthermore, examination of plant succession in many areas points out that

TABLE 1*

DISTRIBUTION OF ENGELMANN SPRUCE (PICEA ENGELMANNI) AND
LODGEPOLE PINE (PINUS CONTORTA)

Section	Percentage Composition**		Range in Altitude	
	Spruce	Lodgepole	Spruce	Lodgepole
Whitefish	20-30	1-14	3000-6000	3000-6500
No. Continental				
W. Cont. Divide	20-23	1-14	3000-6000	3000-6500
E. Cont. Divide	20	50	6500	4000-8000
So. Continental				
Bitterroot R. Drainage	1.6	40	3500-7000	3500-8000
Clark Fork R. Drainage	2-3	-72	3300-9000	3500-9000
Big Hole R. Drainage	4-5	60-75	5500-8500	5600-8500
Yellowstone				
Gallatin & Madison R. Drainages	4-5	60-75	5500-8500	5600-8500
Yellowstone R. Drainage	15	50-60	6000-9000	6000-8500

* After Kirkwood, 1922

** Of total forest cover

fires have been an ever-present factor in areas of marten habitat. While it is clearly evident that extensive logging or burning of large areas is detrimental to the welfare of marten, it is likely that clear-cutting in small blocks, selective logging and burning of small areas may be beneficial to marten on a long term basis. It has been observed that populations of marten and prey species appear to be densest where disturbance of the climax vegetation has resulted in great interspersion of vegetation types and age classes among mature stands. Extensive mature stands do not appear to support comparable densities of marten or prey species.

Trapping Activity

Distribution of trapping activity in Figures 1 and 3 and reference to Table 2 points out the relatively heavy pressure received by the Whitefish Range. Considerably smaller than any of the other major sections, it supported nearly as many trappers during the two seasons as the much larger northern Continental and Yellowstone sections. Furthermore, it produced more marten than the northern Continental section and nearly as many as the Yellowstone. Much excellent habitat is found in the Whitefish Range.

TABLE 2
ANALYSIS OF MARTEN TAKE

Section	Number of Trappers			Total Catch			Average Catch Per Trapper	
	1950	1951	Change	2-year Total	1950	1951	1950	1951
Whitefish	23	15	- 8	38	304	120	13	8
No. Continental	32	13	-19	45	225	63	7	5
So. Continental	37	27	-10	64	470	366	13	14
Yellowstone	28	25	- 3	53	394	178	14	7
Other	13	10	- 3	23	53	69	4	7
Total	133	90	-43	223	1,446	796	11	9

It is possible that this area may have a higher "carrying capacity" than most other areas of marten habitat in the state, although present knowledge of marten habitat requirements is too limited to properly evaluate this situation. One major factor responsible for the pressure received by the Whitefish marten was the premium price received for pelts of this type. According to Wright (1953), martens from the Whitefish Range and Glacier National Park are the Selkirk marten (Martes americana abietinoides) while in the vicinity of the northern Continental section this race intergrades with the less valuable Bitterroot marten (M. a. caurina). Additional trapping pressure arose from the fact that proportionately more of the habitat in this area was accessible by road.

Trapping pressure was relatively light throughout the northern Continental section. Since much of the marten habitat in this region was among the most remote in the state, trappers operated largely in the more accessible portions of the section and few large catches were made. Many inaccessible areas of marten habitat were completely untrapped. Marten from the northern Continental section apparently are intermediate between the Selkirk and Bitterroot martens in characteristics of skeleton and fur (Wright, 1953). Pelts from this area consequently average higher in value than those from the two more southerly sections, but lower than furs from the Whitefish section.

The southern Continental and Yellowstone sections received moderate trapping pressure although there were many areas in both which were relatively untrapped. Marten in these sections are of the Bitterroot marten type. Pelts of these martens are lowest in value of all Montana martens.

It is difficult to critically evaluate the mechanics of marten trapping in the 1950 and 1951 seasons. Table 2 presents findings on the number of trappers, total catch and average catch per trapper as compiled from Department tagging records. It has been suggested by various interested persons that the decline in number of trappers, total catch and average catch per trapper in the 1951 season resulted from consecutive seasons and consequent overtrapping. While this may have been true in a few local areas, available information indicates that dwindling interest in marten trapping, resulting from falling prices, was a far more important factor. Prices for marten pelts fell from an average of \$20.23 in the 1950 season to \$15.49 in 1951. Many trappers interviewed remarked that prices were not sufficient to repay the investment of equipment and effort involved in marten trapping.

Analysis of the tagging records shows that of the 133 trappers operating in the 1950 season only 43 or 32 per cent trapped martens again in 1951, even though many still held trapping licenses. Forty-seven, or 52 per cent of the 90 trappers in 1951 were new trappers. Trappers taking more than 20 martens each tended to repeat more frequently (43 per cent repeated) than trappers taking

20 or fewer (30 per cent repeated). More than half the trappers who repeated trapped in the same location both seasons. In addition, repeaters taking more than 20 marten each tended to trap in the same location slightly more often (6 of 9 or 67 per cent) than repeaters taking 20 or fewer (20 of 34 or 59 per cent).

It is felt that the high rate of turn-over in marten trappers indicated general lack of interest. Conversely, the tendency of repeaters to trap the same location may indicate that most believed that marten populations in the vicinity of their lines were not reduced beyond the point of profitable operation in 1951.

It may be of significance that trappers who operated in 1951 in areas where they or other trappers trapped in 1950 averaged 10 marten per trapper, near the 1950 average of 11 marten each. On the other hand, trappers who, in 1951, trapped where no trapping was done in 1950 averaged only seven marten each.

Size of catch per trapper should reflect to considerable degree the relative length of trap-line or effort expended. The fact that 84 (1950) and 90 (1951) per cent of the trappers took fewer than 20 marten each (Table 3) suggests most marten trappers did not operate extensive trap lines and probably reflects casual interest. The remaining 16 (1950) and 10 (1951) per cent who took over 20 marten each made total catches of 664 and 265 marten or 46 and 33 per cent of the total take in 1950 and 1951, respectively.

Management

From the foregoing analysis it appears likely that from 60 to 70 per cent of the take in future seasons will be made by the shortline trapper who operates as much as possible from a car and when on foot, in relatively accessible areas. With the lack of incentive from low prices, widespread high employment levels and modern-day dependence upon the automobile for transportation, operation of many long trap-lines in remote areas seems unlikely. The initiation of general beaver seasons may provide added incentive for utilization of marten in some back-country areas where both can be trapped profitably. Management plans, however, must provide primarily for proper regulation of trapping pressure in the more accessible areas.

In view of the variation in trapping pressure received by the various major habitat sections described earlier, it follows as a logical conclusion that a "blanket" management plan will not serve the best interests of all areas. Such a plan will result in either depletion or waste in local areas. A blanket management plan which would assure maintenance of adequate breeding stock in the Whitefish Range would very likely result in underutilization of marten populations elsewhere; thus, it

TABLE 3

MARTEN CATCH SIZE CLASS DISTRIBUTION

Size Class	Habitat Section										Total	
	Whitefish		North Con- tinental		South Con- tinental		Yellowstone		Other			
	1950	1951	1950	1951	1950	1951	1950	1951	1950	1951		
1-10	12	12	24	12	21	12	14	18	11	7	82	61
11-20	5	2	6	1	9	9	8	6	2	2	30	20
21-30	3	1	1	0	0	3	4	1	0	1	8	6
31-40	2	0	1	0	4	2	1	0	0	0	8	2
41-50	1	0	0	0	3	0	0	0	0	0	4	0
51-60	0	0	0	0	0	1	0	0	0	0	0	1
61-70	0	0	0	0	0	0	1	0	0	0	1	0
Total	23	15	32	13	37	27	28	25	13	10	133	90

appears that the needs of each section should be met by appropriate management more or less independent of other sections.

Theoretically, a system of semi-ownership such as the registered trapline system in use in various parts of Canada (Stephens, 1945; Eklund, 1946; Robinson and Robinson, 1946; Peterson and Crichton, 1949) would give the trapper the greatest incentive for management on a sustained yield basis. Practical application of such a system in Montana would be difficult because of the relatively limited extent of public land and vastly different economy. Furthermore, a system of registered traplines would not provide the flexibility necessary to meet changing market conditions and varying numbers of trappers.

While it is recognized that sustained annual harvest is the desired goal of proper management, regulation of trapping consistent with practical considerations meets several obstacles. Methods for the manipulation of trapping pressure in Montana are limited by law to regulation of bag limit, time and length of season, and by closing or opening areas to trapping. Marten are not as prolific as muskrats nor as wary as mink; as a result, intensive localized pressure can more easily decimate a marten population. It may be necessary as a safety measure to hold seasons only every other year in heavily trapped areas such as the Whitefish Range until techniques for regulation of trapping pressure can be improved.

Marten seasons held at irregular intervals lead to development of a detrimental philosophy on the part of the marten trapper. If prices are good he will attempt to capture almost every marten on his line since he knows from experience that he probably will not have another chance to trap for several years. During the past two seasons it was uncommon for more than one trapper to trap the same local area. Overtrapping, where it occurred, appeared to result instead from the intensive, localized efforts of a single trapper. Much of this type of overtrapping would disappear under a system of regular annual or biennial seasons which would allow the trapper to anticipate open seasons. In addition, regular seasons would stabilize interest in marten trapping and eliminate much of the turn-over in trappers taking marten. Furthermore, erratic establishment of seasons encourages poaching. Trappers living in areas where marten are common become resentful when seasons remain closed in the presence of obvious surpluses.

Restocking Investigations

Areas investigated with reference to location of transplant sites and sources of transplant stock were as follows: portions of the Cabinet, Mission and Swan Ranges; an area in the Sun River Game Preserve; all major drainages in the Whitefish Range; the Ashley Mountains - Pleasant Valley Mountain area northwest of Kalispell;

the Thompson Peak area between the Thompson and Little Bitterroot Rivers; and the Meadow Peak area west of Kalispell.

Three areas investigated appeared to support marten populations sufficiently dense to provide animals for restocking purposes. These were the Coal, Whale and Wigwam Creek areas, all located in the Whitefish Range. These areas are suffering varying stages of habitat depletion through logging of Engelmann spruce and other species of trees in efforts to control spruce bark beetle depredations. As a result, transplanting of marten from these areas could be regarded to some extent as a salvage operation.

Investigations of possible transplant sites involved three areas. Two appeared to be excellent opportunities for restocking while the habitat in the other (Meadow Peak) was of such limited extent that further work on it was discontinued.

The watershed area drained by the headwaters of Wolf, Pleasant Valley, Ashley and Logan Creeks, and the Little Bitterroot River, includes several areas of apparently good marten habitat. This small mountain range has suffered repeated extensive fires in past years; consequently, the forest cover is composed of many different age classes and successional stages. The unburned areas and older burns along streams and at higher elevations support dense stands of timber. Although some are dominated by spruce and alpine fir, the dominant species in most are lodgepole pine or larch and Douglas fir, with strong elements of spruce and alpine fir at younger age levels. Preliminary investigation did not reveal the presence of marten in the areas examined. It is known, however, that one drainage in this range does support a small marten population. Six marten were taken in this locality in the 1950 season. It is thought that separation of blocks of suitable habitat by extensive burns prevents restocking of vacant habitat by natural dispersal or migration.

The second area believed to offer opportunities for restocking lies south of McGregor Lake, between the Little Bitterroot and Thompson Rivers in Flathead and Sanders Counties. Marten were trapped in this unit around 1900, according to trappers and fur buyers, but no recent reports of marten have been obtained. Aerial reconnaissance shows a number of areas of suitable timber type composition.

RECOMMENDATIONS:

Analysis of the results of the 1950 and 1951 marten seasons suggests that most marten populations in Montana received light or moderate trapping pressure. In addition, three years have passed since the last season. In view of these facts, it is recommended that the marten season be again opened in the fall of 1955. Although prices have remained relatively low, many trappers have expressed the desire to again trap marten. Furthermore, a marten

season would somewhat relieve the heavy trapping pressure on mink in western Montana and would contribute to the income of 100 to 125 trappers.

The findings show that most trappers will operate short traplines in relatively accessible areas. It appears, therefore, that by providing less time for operation on a given line and by setting the season as early as pelt primeness permits to allow greater mobility, less intensive local pressure will result with better distribution of take.

Results of the proposed 1955 season should be carefully analyzed in the same manner as the present study. In addition, collection of carcass materials from the Whitefish Range and other heavily trapped localities should be conducted to provide sex and age ratio data.

It is suggested that groups of habitat units with comparatively homogeneous characteristics, such as the habitat "sections" proposed in the present study, be regarded as separate entities for management purposes. Available data indicate that while some areas receive heavy trapping pressure and might support seasons only in alternating years, other lightly trapped regions could surely stand annual seasons.

Selection of specific transplant sites in restocking operations should involve preparation of generalized timber type maps showing distribution of the important types in the transplanting area. In addition, small mammal populations in the area should be sampled through use of snap-trap lines. Suitability of the site could be evaluated from findings of these methods on the basis of present knowledge of marten habitat requirements.

SUMMARY:

Major areas of marten habitat and trapping activity in Montana fall more or less naturally into four groups of "sections" referred to in this study as the Whitefish, northern Continental, southern Continental and Yellowstone sections. These are outlined on maps together with the distribution of marten take in the 1950 and 1951 seasons.

Data are presented to demonstrate the change in character of marten habitat from north to south in Montana. Engelmann spruce declines from about 20 per cent of the total forest cover in northwestern Montana to approximately two per cent in the southwestern portion of the state. Lodgepole pine exhibits a similar trend in the opposite direction, varying from 75 to one per cent.

Trapping pressure in the various important areas of marten habitat varies considerably. Heaviest pressure is received by the Whitefish Range, largely because of premium prices paid for pelts of

the Selkirk marten and the relative accessibility of most portions of the area.

It is concluded, on the basis of data presented, that in most areas the decline in number of trappers, total catch and average catch per trapper in the 1951 season was due to dwindling interest in marten trapping rather than actual overtrapping.

Plans for future management should be based on the requirements of various units having relatively uniform characteristics instead of on a "blanket" basis.

Preliminary investigation of various areas with reference to location of transplant sites and sources of transplant stock is described.

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Wildlife Restoration Division

Date April 15, 1955

STATE	Montana
PROJECT NO.	W-49-R-4
DATE	April 15, 1955
VOL.	VI NO. 1 & 2

Title of Project: Fur Resources Survey and Investigation

Leader: Fletcher E. Newby

Job Completion Report Job No. II-I Investigations Project

Title of Job: Marten Ecology

OBJECTIVES:

- (1) To obtain basic information on age classes, sex ratios, home ranges, densities, dispersal and population fluctuations on intensive study areas.
- (2) To relate findings on these subjects to habitat factors.
- (3) To perfect live trapping and tagging techniques.

TECHNIQUES USED:

Marten were live-trapped, ear-tagged, carefully examined and released.

FINDINGS:

Intensive field work conducted by Vernon D. Hawley, Graduate Fellow, Montana Cooperative Wildlife Research Unit, on the Anaconda Creek study area in Glacier National Park was supported by the Wildlife Restoration Division from July 1 to September 30, 1954.

The major portion of this period was devoted to live trapping of marten. In addition, a vegetation analysis was initiated to determine the vegetative composition of previously delineated habitat types. Two and one-half miles of control lines were surveyed with the aid of Charles Crunden, Temporary Junior Biologist, on an area to be covered by a one-eighth mile grid system; and further work was done on preparation of a more accurate map of the area.

A total of 951 trap units was set which resulted in 84 captures of 34 marten. One of these marten escaped before any data could be obtained and one animal was taken which apparently had been tagged previously and had lost both ear tags. The sex and age composition of the 33 marten (disregarding the escaped marten) was as follows: nine adult males, four yearling males, nine

juvenile males, seven adult females, two yearling females and two juvenile females.

Captures of previously tagged animals constituted 16 of the 33 marten captured. The sex and age composition of the 17 newly captured, untagged marten was: four adult males, nine juvenile males, one adult female, one yearling female and two juvenile females. Of the 17 newly captured marten, only six or 35.3 per cent were recaptured.

Forty-eight of the animals that have been tagged and released on the study area since August, 1952, and 32 captured since June, 1953, were not recaptured during this trapping period.

The trapping success (per cent of trap units resulting in capture of marten) of 8.8 per cent was low when compared with the 11.3 per cent success obtained during the summer quarter of 1953 and the 35.6 per cent success obtained during the winter quarter of 1954.

The average number of captures per marten was also lower, being 2.4 during this period, 4.5 during the summer of 1953 and 4.0 during the winter of 1954. The average number of captures per male marten (2.6) was more nearly equal that of females (2.3) during this period than during the preceding trapping periods.

Trap mortality consisted of one adult female marten found dead in the trap. This animal had been captured in the preceding three days and had a mean weight of 650 grams during this period.

The mean weight of female marten (excluding juveniles) was 601 grams while the mean weight of males was 1,013 grams during this period.

In addition to the work on the established Anaconda Creek study area, an exploratory trap line was established along Dutch Creek, adjacent to the Anaconda Creek study area by Charles Crunden. This line was maintained for four days in August and resulted in captures of five marten. One animal was a recapture of a previously tagged individual. This marten was recaptured approximately six miles from the site of initial capture.

A juvenile male, taken with seven other marten from the Shorty Creek drainage in the Whitefish Range for use in a pilot study of marten transplanting, bore ear tags. Investigation proved it to be an animal originally tagged in Glacier National Park. This marten had been last handled by Vernon Hawley in the Park on August 24, 1954, and was recaptured by Deputy Game Warden Ed Sager and the Project Leader on October 14, 1954. In that time it had moved an air-line distance of approximately 25 miles.

Captures of six additional marten were produced in investigation of areas in Mathias and Shorty Creeks as possible sources of transplant stock. All were subsequently tagged, examined and released at sites of capture.

RECOMMENDATIONS:

Little progress has been made on the development of more efficient tagging or marking methods. A few ear tags continue to be lost through sloughing of tissue. It is recommended that continued consideration be given this problem.

Disappearance of most juvenile animals from the Park study area and the extensive 25-mile movement of the one juvenile male raises a question of considerable importance concerning juvenile dispersal.

Earlier workers in the North Fork of the Flathead River area concluded that the Park did not contribute significantly to marten populations in the Whitefish Range (Thompson, 1948). All the intensive field work in this earlier study was conducted during the winter period. Findings of live trapping studies indicate that most marten have established well-defined foraging areas by winter and that dispersal of juveniles probably takes place in late summer and early fall (Newby, 1951; Newby and Hawley, 1954). In view of these findings, it is recommended that intensive effort be directed toward determination of the eventual fate of juvenile marten produced on the Anaconda Creek study area and, if possible, in other tributaries of the North Fork of the Flathead River in Glacier National Park.

It is recommended that the present study be carried to final completion to fulfill the objectives described earlier.

SUMMARY:

Live trapping of marten and vegetation analysis were the primary activities in this study. During the period July 1 to September 30, 1954, 951 trap units produced captures of 34 marten. Sex and age composition was as follows: nine adult males, four yearling males, nine juvenile males, seven adult females, two yearling females and two juvenile females (one marten escaped before it was examined). Sixteen of the 33 had been tagged previously. Only 8.8 per cent of the 951 trap units resulted in captures of marten; lower than in previous trapping periods. In addition, the number of captures per marten declined from previous levels. Live trapping in the Dutch Creek area adjacent to the Anaconda Creek study area produced captures of five marten. One animal, previously tagged, was recaptured approximately six miles from the site of initial capture on the Anaconda Creek area. An ear-tagged juvenile male taken in transplanting operations in the Whitefish Range proved to have been originally captured on the study area in Glacier National Park. It had moved an airline

distance of 25 miles in less than two months.

Improvement of ear-tagging or marking methods is suggested. It is recommended that the comprehensive study of marten ecology be continued to final completion with special emphasis on investigation of juvenile dispersal.

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Date April 15, 1955

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Wildlife Restoration Division

STATE	Montana
PROJECT NO.	W-49-R-4
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VOL.	VI NO. 1 & 2

Title of Project: Fur Resources Survey and Investigation

Leader: Fletcher E. Newby

Job Completion Report Job No. II-J Investigations Project

Title of Job: Marten Age Classes

OBJECTIVES:

To develop accurate techniques based on known-age reference material for age determination of wild-caught marten.

TECHNIQUES USED:

Carcasses of known-age marten were obtained from marten breeders. Study of these specimens aimed at providing reliable age criteria is progressing.

FINDINGS:

Carcasses of forty marten of known or known-minimum ages have been received. Ages of these specimens range from new-born to approximately eighteen years. Greater representation in the "yearling" and "two-year-old" classes is particularly desired. Examination of the material suggests that development and growth under captive conditions may be somewhat erratic. In addition, the specimens originate from various subspecific stocks with differing characteristics. As a result, it will not be possible to develop absolute criteria involving measurements directly from this series. Definite reference points provided by this material are, however, of considerable value in developing absolute criteria from statistical analysis of a large sample of a relatively uniform population.

Age determination methods for the marten have been previously suggested by Marshall (1951). Since certain of the preliminary findings of this study do not agree in all respects with conclusions of Marshall's study, it does not appear desirable to report on tentative data of the present study until they can be more completely tested as to reliability and practical application.

DISCUSSION:

In order for aging criteria to be of practical application in

fur animal management, they should at least allow separation of the immature or non-reproducing element of the population from the mature or reproducing classes. This situation in the marten is complicated by the uncertain status of the "yearling" class (animals between one and two years of age). Interviews of marten breeders and reports in the available literature (Markley and Bassett, 1942) indicate that although approximately half of captive female marten 15 to 16 months of age may mate, no young are produced the following spring. Very few males at this age show interest in breeding activities.

Production of young by captive marten known to be fully mature is apparently not as successful as reproduction in wild marten. Markley and Bassett (1942) report 80 per cent failure in litter production of female marten two years of age or over during a 21 year period. In view of the indicated low reproductive rate in captivity, it is entirely possible that at least a portion of the yearling class of wild marten mates successfully and produces young at two years of age.

RECOMMENDATIONS:

Collection of known-age materials from carcasses of ranch-raised marten should be continued. Development of reliable criteria for distinguishing year-classes and/or breeding and non-breeding segments of the marten population should be carried to successful completion.

Collection of skeletal material from possible future trapping seasons is extremely desirable to provide large samples drawn from populations of relatively uniform characteristics. In addition, efforts should be made to obtain for purposes of examination and analysis any large collections of marten skeletal materials now held by other workers in the field.

Adequate investigation of the true breeding status of the yearling class of wild marten is essential to thorough understanding of reproductive potential of marten populations. Observations of tagged marten will be continued under Job No. II-I: Marten Ecology, and should provide valuable information on breeding activity. In addition, efforts should be made to properly collect and preserve as many reproductive tracts as possible from future trapping seasons. Upon development of aging criteria adequate for distinguishing a yearling class, histological examination of such reproductive material would largely clarify the present uncertain situation.

SUMMARY:

Carcasses of forty marten, ranging in age from new-born to eighteen years of age, were received from marten breeders. Although variability in pertinent skeletal characters appears

to preclude development of absolute criteria, reference points furnished by this material are valuable in evaluating analysis of samples of wild marten populations. Presentation of specific data is postponed pending further investigation.

Accurate evaluation of the true breeding status of wild marten between one and two years of age is absolutely essential to understanding of marten productivity. Recommendations for clarification of this situation include live trapping observation of wild marten marked as known juveniles and histological analysis of reproductive tracts correlated with application of eventual accurate aging criteria.

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STATE Montana
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Title of Project: Fur Resources Survey and Investigation

Leader: Fletcher E. Newby

Job Completion Report Job No. II-K Investigations Project

Title of Job: A Study of the Otter's Food Habits Along a Segment of the
Gallatin River

OBJECTIVES:

To determine, by scat analysis, the otter's food habits in the
Gallatin River.

FINDINGS:

Inactive during report period. The economic importance and
pending management of the mink population established a priority
for completing Job No. II-F, Mink Age and Sex Ratios. The mag-
nitude of preparing mink samples did not allow sufficient time
for analysis of collected otter scats.

SUMMARY:

Analysis of 1,120 otter scats collected along the Gallatin River
from September, 1952, through October, 1953, has not been com-
pleted.

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STATE	Montana
PROJECT NO.	W-59-R-2
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Title of Project: Eastern Montana Big Game Surveys

Leader: Don L. Brown

Job Completion Report Job Nos. III-C, IV-A, V-A Investigations Projects

Title of Job: Eastern Montana Deer Population Studies - Checking Station
Analysis

ABSTRACT

At 14 checking stations, 3,298 deer were tallied. A decrease of 337 from last year, however there were twice as many stations in 1953. Overall success in eastern Montana was 67.5% as computed from checking station data. Southeastern Montana averaged a 63% hunter success, and Central Montana averaged 53%.

Hunter origin remained approximately the same as preceding years for which there is information.

STATE	Montana
PROJECT NO.	W-59-R-2
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Title of Project: Eastern Montana Big Game Surveys

Leader: Don L. Brown

Job Completion Report Job No. III-C, IV-A, V-A Investigations Projects

Title of Job: Eastern Montana Deer Population Studies - Checking Station Analysis

DATE: 1954 Hunting Season

PERSONNEL: Checking Station Operators

For the third consecutive year, either sex deer seasons have been held throughout most of eastern Montana. The seasons, as in years past, ranged from 3 days either sex in conjunction with various length buck seasons to straight 30 day either sex seasons. Some areas, although able to support 15 or 30 day either sex seasons, had only 3 or 4 day either sex seasons or buck seasons only, because of local opinions and pressure. Existing information on the mechanics of either sex seasons in established deer populations indicates the fallacy of such opinions. Continued work in the educational aspect of selling these seasons will perhaps eventually bring about the necessary understanding.

OBJECTIVES:

Accumulation and analysis of checking station data applicable to eastern Montana deer population studies.

TECHNIQUES USED:

Checking stations were operated at advantageous points in or adjacent to hunting areas. Data collected consisted of sex, species, age, hunter origin, etc. Operation of the stations was during the days when the greatest number of hunters could be checked.

FINDINGS:

The data from all stations is broken down into areas of coverage. For comparisons of similar data in these areas for the 1953 seasons, refer to P-R Quarterly Vol. IV No. 4, 1953.

LITTLE BELT MOUNTAINS

A buck season from October 15th to November 15th and an either sex season from October 31st to November 15th was held in this area. On Tenderfoot Creek, there was an either sex season from October 1 to November 15. This section deals with the harvest taken from the north side of the Little Belts. Four checking stations were operated a total of 41 days.

UTICA STATION

This station was operated throughout the season to check both deer and elk hunters. Many of the hunters checking through this station were primarily elk hunters, deer hunting being a secondary or casual objective.

The following tables list the deer checked:

<u>Date</u>	<u>Kill</u>	<u>No. Hunters Checked</u>
October 15-30 (Bucks Only)	145	873
October 31 - November 15 (Either Sex)	458	Unknown
Total	603	Unknown

Sex and age breakdown

<u>Adult Male</u>	<u>Young Male</u>	<u>Female</u>	<u>F. Fawn</u>	<u>M. Fawn</u>	<u>Unc. Fawn</u>
132	129	257	25	29	31

The 603 deer checked at Utica is about 100 more than for 1953. Assuming the Utica station kill figures since 1940 are reliable indicators of relative abundance, the data given below suggests that either sex seasons are still applicable to this area.

<u>Year</u>	<u>No. Deer Checked</u>	<u>No. Hunters Checked</u>
1940	156	Unknown
1942	149	"
1943	301	"
1944	54	"
1945	94	"
1946	240	"
1947	205	1766
1948	192	1642
1949	317	1358
1950	247	1679
1951	384	2285
1952	308	2308
1953	507	1216
1954	603	Unknown

(Either sex seasons have only been held in the Belts during the past 3 or 4 years.)

Age and Sex (Utica Station)

Year	1953	1954
Adult Males	224	132
Yearling or Young Males	42	129
Adult Females	190	257
Female Fawn	17	25
Male Fawn	24	29
Unclassified Fawn	10	31
Total	507	603

DRY WOLF-RUNNING WOLF STATION (Operated during either sex only)

	Oct. 31	Nov. 1	2	6	7	11	14
Males	25	1	1	4	10	6	7
Females	154	15	10	20	40	3	12
Fawns	73	7	1	-	-	1	10
Total Deer	252	23	12	24	50	10	29
Total Hunters	389	37	33	91	130	32	89

Comparing this station with last year:

	1953	1954
Males	11	54
Females	229	254
Yearling Males	39	--
Fawn Males	39	1
Fawn Females	30	2
Fawn Unclassified	10	89
Total Deer	358	400
Total Hunters	694	701
% Success	51.6%	57.0%

The two other stations for the area:

ARMINGTON Y (Operated for either sex only)

Date	Oct. 31	Nov. 1	6	7	Total
Adult Male	14	2	6	-	22
Young Male	25	7	5	2	39
Female	71	10	15	3	99
Female Fawn	4	1	2	1	8
Male Fawn	8	6	2	-	16
Total Deer	122	26	30	6	184
Total Hunters	208	34	49	28	319
% Success	59%	76.5%	61%	21.4%	58%

Total deer checked through this station last year:

Adult Males	12
Adult Females	117
Yearling Males	31
Fawn Males	22
Fawn Females	25
Total Deer	207
Total Hunters	349
Success	59.5%

WILLOW CREEK (During either sex only)

October 31
Male 3
Female 26

Comparing the 1954 kill for the Little Belts with that of 1953:

	1953	1954
Adult Males	258	211
Young Males	112	168
Adult Females	612	636
Fawn Males	61	46
Fawn Females	55	35
Fawn Unclassified	77	120
Total Deer	1,175	1,216
Total Hunters	2,352	*Unknown
% Success	50%	57.5%

* The figure 57.5 is based on the material from the Running Wolf-Dry Wolf and Armington Y Stations. Total hunters are not known for Utica and Willow Creek Stations.

The hunter origin for the Little Belt Mountains during 1954
(based on 1,783 hunters)

0-66 miles from center of hunting area 1,267 or 71%
 1,029 from Gt. Falls or 57.5% of the total
 42 from Lewistown or 2.4% of the total
 238 from the local area or 13.5% of the total

66-99 miles 135 or 7.5%
 99 miles and over 381 or 21.2%
 These came from many towns, most of which did not occur frequently enough to list

From an overall stand point this year's data for the Little Belts compared quite closely with that of 1953. In general the success of hunters is about the same--50% for 1953 and 57.5% for 1954. The kill differs only by 41 animals. Origin of the hunters compares very closely, indicating the bulk of the hunters (47% in '53 and 57% in '54) hunting in the Little Belts will be from Great Falls. Lewistown, although having nearly 7,000 people, does not contribute a great deal in the harvest of these animals.

MEAGHER COUNTY

(South Side of Little Belts and Castle Mountains)

A station was set up near Harlowton and checked hunters from the South side of the Belts and Castles.

HARLOWTON

Date	October 15	16	17	Total
Adult Males	10	12	25	47
Young Males	38	37	50	125
Total Deer	48	49	75	172
Total Hunters	73	83	193	349
Success	66%	59%	39%	49.5%

In addition the station was operated on November 16th during the either sex season - bucks 1, does 2, fawns 1, hunters checked 6 - of the 349 hunters checked 122 or 35% came from Harlowton and 186 or 53% came from Billings, Roundup and 14 or 4% hunters represented and the remainder of the hunters were from smaller towns not occurring frequently enough to list. To make a comparison with 1953 is rather difficult because of the difference in number of stations and time of operation.

HIGHWOOD MOUNTAINS

The same length and kind of season was held here as was held in the Belt Mountains. The station was the same as the Armington Y and the data was collected at the same time as that for the Belts - north side:

Date	October 31	November 1	6	7	Total
Adult Male	2	-	-	-	
Young Male	4	-	-	-	
Female	14	-	-	-	
Female Fawns	3	-	-	-	
Male Fawns	1	2	-	-	
Total Deer	24	2	-	-	26
Total Hunters	31	2	-	-	33
% Success	77.5	100			79%

For all practical purposes the hunters were from Great Falls. In addition the Armington Y station checked hunters that hunted in widely scattered areas not falling within the general areas listed. This amounted to 9 adult male, 15 yearling male, 23 female, 11 female fawns, 4 male fawns, making a total of 62 deer and 73 hunters.

MISSOURI RIVER BREAKS (North Side)

The area concerned here, had a buck season from October 15th to 28th, and an either sex season from October 29th to 31st, all dates inclusive. Only two stations were operated, one on Willow Creek Road and one $\frac{1}{2}$ mile south of Malta. Again comparison of information is not possible due to the variations in stations and dates of operation.

WILLOW CREEK ROAD STATION

Date	October 15	16	17	29	30	31	Total
Adult Male	44	43	42	7	7	27	
Young Male	16	22	20	13	4	10	
Female	-	-	-	45	37	80	
Fawn Male	-	-	-	6	14	13	
Fawn Female	-	-	-	6	3	9	
Total Deer	60	65	62	76	64	139	466
Total Hunters	109	119	130	128	125	252	863
% Success	55.0	54.6	47.7	59.4	51.2	55.2	51.7

MALTA STATION

Date	October 15	16	17	23	24	29	30	31	Total
Male	15	31	84	0	-	6	19	38	
Female	-	-	-	-	-	3	27	92	
Male Fawn	-	-	-	-	-	-	-	-	
Female Fawn	-	-	-	-	-	-	-	-	
Total Deer	15	31	84	0	-	9	46	130	315
Total Hunters	52	62	227	8	-	19	65	227	660
% Success	29%	50%	37%	0%	-	47.5%	71%	57.5%	48%

Overall success of the combined stations is 51.0% or 781 deer. In addition to the checking stations, Warden DesRosier checked 47 hunters who killed 25 deer:

11 Adult Males (one white-tail)
 12 Adult Females
 2 Male Fawns (one white-tail)

This gives a success ratio of 53% for these hunters, which is very close to that found at the stations.

Regarding the origin of these hunters:

401 or 24.7% were from Glasgow
 295 or 18% were from Malta
 155 or 9.5% were from Havre

The remaining 50% were from other towns in the area: (Nashua, Opheim, Chinook, Plentywood, etc.).

MISSOURI RIVER BREAKS (South Side)

In this area west of the Musselshell the season was October 15th to November 15th, bucks, October 31st to November 2nd either sex. East of the Musselshell it was either sex from October 15th to October 31st. Checking stations for this area which also includes the Judith and Moccasin Mountains were operated on Highway 19, north of Lewistown, and at Grassrange.

HIGHWAY 19

Date	October 15	16	17	31	Total
Males	20	29	32	15	
Females	-	-	-	18	
Fawns	-	-	-	3	
Total Deer	20	29	32	36	117
Total Hunters	62	34	47	57	200
% Success	32%	85%	68%	63%	58.5%

GRASSRANGE

Date October 31

Adult Males	12
Yearling Males	11
Females	11
Male Fawns	2
Female Fawns	1
Total Deer	37
Total Hunters	46
% Success	80%

The total deer checked from this area (Missouri River Breaks) and compared to 1953:

	1953	1954
Males	132	119
Females	63	29
Fawns	26	6
Total Deer	221	154
Total Hunters	460	246
% Success	48.5%	62.5%

Hunter origin for this area:

From Lewistown 210 or 85%

Local - 16 or 6.5%

Remainder from towns not occurring frequently enough to list

SNOWY MOUNTAINS

This area had a buck season from October 15th to November 15th, an either sex season from October 31st to November 2nd, and a white-tail either sex season from November 3rd to November 15th. A station was set up at the old brewery southeast of Lewistown. Information collected is as follows:

Date	October 31	November 1	Total
Males	20	2	
Females	24	1	
Fawns	5	0	
Total Deer	49	3	52*
Total Hunters	139	15	154
% Success	35	20	34

* Includes some white-tail.

Origin of hunters - based on 120:

0-66 miles from center of area 107 hunters
 104 of these from Lewistown or 93%
 of the total
 66-99 miles from center of area 5 hunters
 100 miles and over 8 hunters

LOWER MISSOURI AND LOWER YELLOWSTONE RIVERS

In 1953 three stations were operated for a 10 day either sex season. This year only one station was operated for an eight buck season and a three day either sex. Again the presence of several variables makes comparison of year to year data quite difficult.

The following information was gathered at the station one mile west of Nohley:

Date	October 31*	November 5	6	7	Total
Males	20**	6	0	5	31
Females	-	12***	3	4	19
Male Fawns	-	5	2	3	10
Female Fawns	-	3	1	1	5
Total Deer	20	26	6	13	65
Total Hunters	90	53	30	50	130
% Success	22	50	20	26	50

* Bucks Only

** Included one mule deer

*** With antlers

Hunter origin - based on 223 hunters.

Sidney 78 (34.4%)
 Fairview 109 (48.2%)
 Nohley and vicinity 12 (5.3%)
 Other 24 (10.6%)

Comparing the information from the Nohley station last year against this year:

	1953	1954
No. Days Operated	4*	4**
No. Hunters Checked	237	223
No. Deer Checked	92	65
% Success	39	29

* All four days either sex

** One day bucks only, three days either sex

Comparing hunter success from the Nohley station for either sex only, the success is 34% in 1954 and 39% in 1953. But the comparison is made between 4 days of information and 3 days of information. Eliminating the first day of the 1953 season data from the Nohley station, the hunter success percentages become 35% for 1953 and 34% for 1954.

Hunter origin cannot readily be compared because sufficient breakdown is not available for 1953.

Hunter success is low in this area because the majority of the hunting area is white-tail habitat (river bottom) and the animals involved are white-tail. For this reason longer either sex seasons may aid in increasing the harvest. Hunting with shot-gun may also be instrumental in aiding in a larger kill. It is quite apparent a larger harvest is needed on both the lower Yellowstone and Missouri Rivers from the following facts. The areas in question are excellent white-tail habitat. Hunter harvests have never been very high as indicated by checking station data. Deer depredations on bottom land crops (alfalfa, corn, etc.) has occurred in the past and is occurring now. There is a strong possibility, with the filling of Garrison Dam in North Dakota on the Missouri River, these areas may receive additional white-tail from the resulting flooded areas along the Missouri in North Dakota. From this viewpoint very liberal seasons and methods of harvest should be established in these areas for 1955.

ASHLAND DISTRICT

For the third consecutive year, a 30 day either sex deer season was held in this area. The area involved in the first either sex season (1952), included approximately 1,584 square miles (this embodies the area referred to as the Ashland District). In 1953 the area of the 30 day either sex season was extended to include about 2,484 square miles. In 1954, the 30 day either sex season extended over an area of 12,024 square miles. In 1955 plans are for a 30 day either sex season to cover approximately 22,000 square miles. This proposed season will cover roughly the area lying east of the Big Horn River and south of the Yellowstone River.

To make comparisons of data gathered at checking stations operated in the Ashland District for the years mentioned would be rather difficult, since there are a number of variables.

This is illustrated in the following table:

Year	Area (Sq. Mi.)	No.		Hunters Checked	Deer Checked	% Success
		Checking Station	Man Days			
1952	1,584	2	28	1,468	862	58.7
1953	2,484	3	18	Unknown	720	Unknown
1954	3,996	2	12	1,171	787	58.8

In order that future comparisons can be made, it is suggested that stations be operated in almost exactly the same manner and place year after year. The following table illustrates how this might be done for such yearly comparisons. For all practical purposes, these stations were operated from 8 a. m. until such time in the evening when hunters are no longer coming through in any appreciable numbers. The station on Highway 212 was about 60 miles from the main hunting areas and consequently must remain open until as late as midnite on busy days like Sunday.

HIGHWAY 212 (1954 - 30 days either sex)*

Day	Bucks	Does	M. Fawns	F. Fawns	Hunters	% Success
Fri. Oct. 15	30	15	1	1	94	50
Sat. " 16	58	42	5	4	161	68
Sun. " 17	104	74	7	4	301	63
Sat. Nov. 13	8	6	5	0	33	57
Sun. " 14	41	38	8	10	152	64
Mon. " 15	0	2	1	0	4	75

ASHLAND STATION

Fri. Oct. 15	20	18	0	3	52	79
Sat. " 16	49	18	6	1	96	77
Sun. " 17	101	48	5	5	218	73
Sat. Nov. 13	9	2	1	0	13	92
Sun. " 14	18	7	6	3	44	77
Mon. " 15	2	1	0	0	5	60

* The station on Highway 212 is located about 4 miles south of Miles City at the Highway Department's weighing station. The Ashland station is located in the town of Ashland at the junction of Highway 8 and the Tongue River road near the cafe.

A comparison of the kill composition for 1952-53-54:

	1952	1953	1954
Bucks	349	339	440
Does	398	311	271
Male Fawns	60	37	45
Female Fawns	55	33	31
Total	862	720	787

It is interesting to note the difference in the B:D ratios. Hunter selectivity is possibly in some measure responsible. That is, a greater number of bucks will be harvested during either sex seasons, provided the either sex season is not in its first year and

the hunters using the area are conditioned to either sex seasons.

Table I shows hunter origin in the Ashland area for the past three hunting seasons, and Table II gives hunter origin for the past season. Figures in Table I in parenthesis are the number of hunters the percentages are based on.

TABLE I

Miles from Center of Hunting Area	1952 (764)	1953 (827)	1954 (1157)
0 - 50 miles	6%	5%	2%
50 - 100 miles	37%	42%	45%
100 - 150 miles	32%	40%	32%
150 miles and over	25%	12%	20%

TABLE II

Hunter origin for 1954 season - based on 1,157 hunters

0 - 50 miles	
28 hunters - local	
50 - 100 miles	
517 hunters (440 or 85% from Miles City)	
100 - 150 miles	
375 hunters (300 or 80% from Billings)	
150 miles and over	
237 hunters (95 or 40% from Wolf Point)	

Table I indicates during the past three years, the harvest for the area has been accomplished largely by Miles City and Billings hunters. It is worthwhile to mention, the road between Ashland and Billings is completely oiled. This was finished during the past summer. There was, however, no great increase in the number of hunters from Billings this year over last year.

It will probably be necessary to operate these stations for several more years in order to establish definite hunter-harvest patterns and trends. It would also be advantageous to have lighting facilities at all checking stations.

The following information was collected between 9 a. m. - 12 noon and 2 p. m. and 4 p. m. on Sarpy Creek in Rosebud County on October 17th (Sunday) by W. S. Maloit, Deputy Game Warden at Forsyth.

Number of hunters checked	104
Number of deer checked	20
Percent success	19%

Kill Composition	
Bucks	13
Does	3
Fawns	4

Hunter Origin	
Billings	65 (62%)
Hysham	26 (25%)
Other	13 (12%)

DISCUSSION AND CONCLUSIONS:

At 14 checking stations a total of 3,298 deer were checked. At 28 stations in 1953, 3,635 deer were checked. Although the number of hunters checked for both years is not complete, it can probably be used as an index on an area-wide basis. In 1953 a total of 6,662 hunters were checked, while this year 4,870 were checked. Computing hunter success for eastern Montana from these figures:

1953 - hunter success - 54.5%
 1954 - hunter success - 67.5%

Separating the 1954 figures into general areas for success only:

CENTRAL MONTANA

Belts north side:	584 deer, 1,020 hunters - 57% success
Belts south side:	172 deer, 349 hunters - 67% success
Snowy Mtns:	52 deer, 154 hunters - 34% success
Highwood Mtns:	26 deer, 33 hunters - 79% success
Overall:	834 deer, 1,556 hunters - 53% success

MISSOURI BREAKS

North side:	806 deer, 1,570 hunters - 51% success
South side:	154 deer, 246 hunters - 62% success
Overall:	960 deer, 1,816 hunters - 53% success

LOWER YELLOWSTONE AND LOWER MISSOURI RIVERS

Nohley:	65 deer, 223 hunters - 29% success
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ASHLAND DISTRICT

Ashland:	787 deer, 1,171 hunters - 67% success
Sarpy Creek:	20 deer, 104 hunters - 19% success
Overall:	807 deer, 1,275 hunters - 63% success

In analyzing the hunter success data, several variables or introduced errors become apparent. The numbers of stations and the time or length of operation is not comparable to previous years. Opening days (i.e., season opened on Wednesday in 1952, Thursday in 1953, and on Friday in 1954) have not been consistent. This variable will never be eliminated as long as the season opens on the same date and not day every year.

Hunter origin for each major hunting area has remained more or less the same from year to year. For example the Ashland district receives the bulk of its hunters from Miles City and Billings. The Belt Mountains, north side, receives a large portion of the hunters from Great Falls.

Comparison of B:D ratios for the areas in general, indicate the harvest of does exceeds that of bucks. From a management standpoint this is satisfactory since any area having a 1:1 sex ratio is supporting surplus bucks. This year in the Ashland district more bucks were harvested than does. This may reflect a surplus of bucks or a high degree of hunter selectivity or both. Field observations have not indicated a lopsided sex ratio, leaving the selectivity of hunters as the probable cause. Ascertaining buck:doe ratios from checking station data under any circumstances is at best hazardous.

Up to the present, it is believed the types of seasons held in eastern Montana have not been detrimental to the deer populations. It is believed that some areas could have longer either sex seasons; these are the areas that have had only two or three day either sex seasons in conjunction with 15 or 30 day buck seasons.

RECOMMENDATIONS:

It is recommended either sex seasons of at least 15 days duration be continued throughout eastern Montana, subject to change as subsequent information warrants.

ACKNOWLEDGEMENTS:

The information and data contained in this report was compiled by the following Department personnel:

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Harold Picton, Junior Biologist
Joe Egan, Junior Biologist

Prepared by:

Name Joe Egan

Title Junior Biologist

Approved by:

Montana State Fish and Game Department

By Faye M. Couey, Ass't Coordinator

Wildlife Restoration Division

Date April 15, 1955

STATE	Montana
PROJECT NO.	W-59-R-2
DATE	April 15, 1955
VOL.	VI NO. 1 & 2

Title of Project: Eastern Montana Big Game Surveys

Leader: Don L. Brown

Job Completion Report Job No. I-S, II-S Investigations Report

Title of Job: Bighorn Sheep Survey -- Billy Creek

ABSTRACT

During August 1954, 56 man-days were spent investigating the bighorn sheep plant in the Billy Creek area of the Fort Peck Game Range. Six rams, four ewes and thirteen unclassified bighorns were noted. The use of horses did not greatly surpass foot coverage made in previous surveys. There is need for the development of sound census techniques applicable to this area for bighorn sheep surveys. Habitat conditions were for the most part excellent. Hunter-harvest in the very near future is recommended.

STATE	Montana
PROJECT NO.	W-59-R-2
DATE	April 15, 1955
VOL.	VI NO. 1 & 2

Title of Project: Eastern Montana Big Game Surveys

Leader: Don L. Brown

Job Completion Report Job No. I-S, II-S Investigations Project

Title of Job: Bighorn Sheep Survey -- Billy Creek

PERSONNEL:

U. S. Fish and Wildlife Service and Montana Fish and Game Department

DATES:

August 9 - 17, 1954

OBJECTIVES:

To acquire information relative to movements of the bighorn sheep planted at Billy Creek in the Missouri Breaks.

To acquire data relative to present census techniques for bighorn sheep in badlands topography.

To obtain data on mortality, reproduction, forage use, forage conditions and water.

PROCEDURE:

For the most part, surveys into this area relative to the bighorns have been in spring or summer with coverage by foot. Horses were used to cover the area during this survey by a considerably larger crew than had been used in past investigations.

During the ten days the survey was conducted there was a total of 56 man-days expended. The coverage on horseback generally followed the procedure as outlined in P-R Quarterly, Vol. IV, No. 2, 1953.

A base camp was set up at the old pasture site for five days and then moved approximately six miles due east on the F. McKeever, Jr. lands. Coverage was made during early morning and evening when possible.

FINDINGS:

For the 56 man-days spent during the survey, the number and classification of the bighorns observed are as follows:

6 rams (1 full curl; 3½ curls; 2 unknown)
4 ewes (age unknown)
13 unclassified

In addition, 12 animals were observed that were probably bighorns, but positive identification was not possible. These will not be used in any population computations. No lambs were observed during the survey.

Range and forage conditions were very good to excellent in the area. Water was plentiful in several of the canyons, and reservoirs on the edge of the breaks contained ample water.

Using horses enabled the crew to cover a little more ground during the course of a day, but it does not appear to greatly surpass coverage on foot, from the standpoint of actual data acquired.

All sheep observed were within 10 miles of the old enclosure site, and the number seen does not differ greatly from the numbers observed during past surveys.

Some inclement weather hampered the progress of the investigation.

DISCUSSION:

The number of sheep observed and classified is rather low for the number of man days involved. The nature of the terrain in this area makes any type of census quite difficult. Consequently there is need for extensive investigation to determine a suitable census technique.

Using horses did not greatly increase the efficiency of the crew over coverage on foot. As time and manpower allow, other methods should be tried using combinations of horseback, foot and possibly some sort of aerial coverage. Surveys should also be conducted during the winter months. It is hoped that such a survey can be conducted in the area this winter.

A permanent water supply in the badlands proper is a matter of speculation, since they are of an arid to semi-arid nature. However, during extremely dry periods, water would probably be available in the Fort Peck reservoir. Only investigations over a period of years will bring to light this aspect of the Billy Creek sheep plant.

In the past, lambs have been observed in every survey, however none were observed during this investigation. This is not necessarily an indication of a lagging reproduction, since only four

ewes were classified.

CONCLUSIONS AND RECOMMENDATIONS:

Since this bighorn plant has been made (Nov. 1947), all available information suggests the population may be exhibiting the pattern of a sigmoid curve. That is, the increase of sheep numbers in the enclosure and those outside of the enclosure had been steady and fairly uniform. Although conclusive evidence is not available, the sigmoid pattern as exhibited by this herd is thought to be well advanced. A hunter harvest used as a management tool is most effective before the peak of the sigmoid curve is reached. For this reason it is recommended that steps be taken to open the area to the proper type of hunter harvest in the very near future.

REFERENCES:

Job No. I-S, II-S Bighorn Sheep Survey -- Billy Creek

Allee, W. C., Orlando Park, Alfred E. Emerson, Thomas Park and Karl P. Schmidt. 1949. Principles of Animal Ecology. Philadelphia. W. B. Saunders Co. pp. 301-330.

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Approved by:

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Wildlife Restoration Division

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Date April 15, 1955

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STATE	Montana
PROJECT NO.	W-60-R-2
DATE	April 15, 1955
VOL.	VI NO. 1 & 2

Title of Project: Western Montana Big Game Surveys

Leader: Merle Rognrud

Completion Report

Job No. I-B

Investigations Project

Title of Job: Survey of Big Game Losses

Big Game Harvest and Hunting

Abstract

Twelve conventional checking stations and nineteen self-register checking stations in western Montana checked a total of 1,161 elk, 737 mule deer, 994 white-tailed deer, 33 mountain goats, 16 black bears and 3 grizzly bears in 1954. Average hunter trip success on all game was about 15.6%. An analysis of the sex of animals killed showed a generally higher proportion of males in the harvest. Age composition of samples of game herds in the South Fork of Flathead River and the Bitterroot areas indicated a high survival rate of elk in $5\frac{1}{2}$ to 10 year age class of the South Fork elk herd and possible increased management efficiency of Bitterroot area deer herds. The average number of hunters per car was 2.2. Approximately 70 to 85% of hunting pressure on an area originates in the nearest large center of population. A concerted effort to determine total goat harvest resulted in 33 known kills. Hunter success on goats was about 19%. About 62 to 67% of the recorded elk harvest in the South Fork of Flathead River and Swan River areas was taken on the first three days of the open season. Three percent of the total recorded white-tailed deer kill in the Swan River area was taken in the first half (16 days) of the open season. Use of self-register checking stations by hunters decreased about 30% in 1954.

STATE	Montana
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Title of Project: Western Montana Big Game Surveys

Leader: Merle Rognrud

Completion Report

Job No. I-B

Investigations Project

Title of Job: Survey of Big Game Losses

Big Game Harvest and Hunting

OBJECTIVES:

To determine the loss to big game populations (particularly elk and deer) due to hunting. Determine hunter success, source of hunting pressure, number, sex and age composition of kill, location of kill to indicate distribution, and other factors associated with hunting. Collect physical characteristics and herd reproduction data.

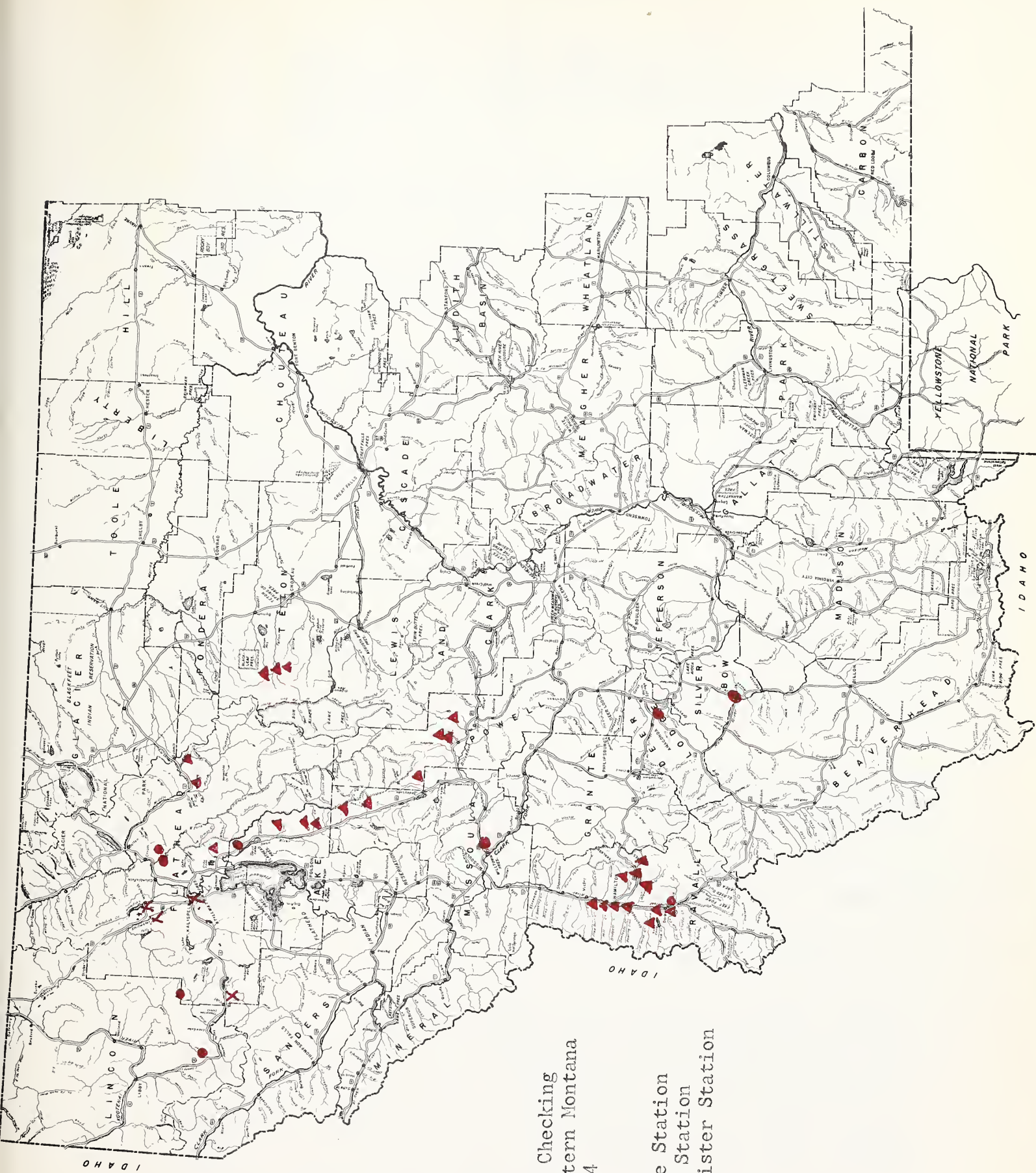
PERSONNEL:

Western Montana Unit Big Game Biologists
Western Montana Warden Supervisors and Deputy Game Wardens
Checking Station Operators

TECHNIQUE USED:

During the 1954 big game hunting season, 12 conventional and 19 self-register checking stations were used to sample the harvest of big game in some of the major hunting areas of western Montana. These stations and the areas they served are as follows: (Also see map, Figure 1)

Coram.....	Lower South Fork of Flathead River
Hungry Horse.....	" " " " " "
Swan River.....	Swan River
Bonner.....	Blackfoot and Clearwater
Tally Lake.....	Western Flathead County
Whitefish.....	" " "
Kalispell.....	" "
Mill Creek.....	Big Hole River
Divide.....	" " "



Location of Checking
Stations in Western Montana
1954

- Full Time Station
- X Week-end Station
- ▲ Self-register Station

Darby.....	Upper Bitterroot River
Self-Register.....	South, Middle Forks of Flathead
Island Lake.....	Fisher River, Wolf Creek
Waylett's.....	" " " "

Methods of operation at the stations were essentially the same as those used in previous years. Hunters were checked out only (except at Coram and Hungry Horse). Data recorded included species, sex, age of animals, drainage of kill, gun caliber, number of days hunted for successful hunters, number of hunters per car, number of unsuccessful hunters, and the name and address of successful hunters.

At Coram and Hungry Horse stations, which check hunters both in and out, each hunter was asked to bring in one-half of the lower jaw of his elk to provide age classification data on the South Fork elk herd. The elk lower jaw bone was displayed at each station to show the hunters just what was wanted. The South Fork of Flathead is hunted primarily for elk and it was felt that age classification data on the elk of that area would be valuable in the management of the herd.

At Waylett's, Island Lake, and Darby stations, hunters were again asked to bring in reproductive tracts of female deer.

Three stations, Tally Lake, Whitefish and Kalispell, were operated only on week ends and the Kalispell station was discontinued after October 24. Flathead County was open to the hunting of buck deer only and it was desired to obtain data on hunting pressure on this area as well as kill data.

The self-register stations were operated as described in the P. R. Quarterly for October-December, 1953. Results of the seven self-register stations located in the Bitterroot area are included in the kill figures for that area.

While no formal checking station was set up in the Deer Lodge area, the local deputy game warden checked 116 elk.

1. Summary of big game kill from western Montana checking stations.

The summary of big game killed as given in Table I does not give the total kill for western Montana as without exception, all stations recorded only a portion of the game killed in the areas they were set up to check. Checking stations which depend upon the voluntary cooperation of the hunters for their successful operation, invariably fail to check all hunters. However, the summary does provide a basis for estimating total kill, a check on the trend of harvests from year to year, and a check with the statewide hunter questionnaire.

The total kill recorded at checking stations in 1954 was slightly lower than the total recorded in 1953 for comparable areas and

TABLE I

CHECKING STATION SUMMARY OF BIG GAME KILL IN WESTERN MONTANA, 1954

		ELK				BEAR	
		Male	Female	Calf	Total	Black	Grizzly
<u>Coram, Hungry Horse</u>	No.	158	149	48	355	3	2
South Fork of Flathead River	%	44.5	42.0	13.5	100		
<u>Bonner</u>	No.	63	50	21	134	4	0
Blackfoot-Clearwater River	%	47.0	37.3	15.7	100		
<u>Swan River</u>	No.	16	28	18	62	2	1
Swan River	%	25.8	45.2	29.0	100		
<u>Tally Lake</u>	No.	0	0	0	0	1	0
Western Flathead County	%						
<u>Whitefish</u>	No.	0	0	0	0	2	0
Western Flathead County	%						
<u>Kalispell</u>	No.	0	0	0	0	0	0
Western Flathead County	%						
<u>Waylett's, Island Lake</u>	No.	24	0	0	24	0	0
Fisher River - Wolf Creek	%						
<u>Mill Creek - Divide</u>	No.	96	59	21	182	0	0
Big Hole River	%	54.5	33.5	12.0	100		
<u>Darby</u>	No.	123	72	35	230	4	0
Upper Bitterroot River	%	53.5	31.3	15.2	100		
<u>Self-Register</u>	No.	32	22	4	58	0	0
South Fork of Flathead	%	55.2	38.0	6.8	100		
<u>Deer Lodge</u>	No.	--	--	--	116		
Cottonwood Creek	%						
TOTAL	No.	512	380	147	1161		
	%	49.3	36.5	14.2	100		

1/ Total includes 5 animals of unknown sex and age.

TABLE I (Continued)

CHECKING STATION SUMMARY OF BIG GAME KILL IN WESTERN MONTANA, 1954

		MULE DEER				WHITE-TAILED DEER			
		Male	Female	Fawn	Total	Male	Female	Fawn	Total
<u>Coram, Hungry Horse</u>	No.	24	0	0	24	11	0	1	12
<u>South Fork of Flathead</u>	%					91.6		8.4	100
<u>River</u>									
<u>Bonner</u>	No.	68	21	22	111	130	103	46	279
<u>Blackfoot-Clearwater</u>	%	61.2	18.9	19.9	100	46.6	36.9	16.5	100
<u>River</u>									
<u>Swan River</u>	No.	2	1	0	3	59	33	40	132
<u>Swan River</u>	%	66.0	33.0		100	44.7	25.0	30.3	100
<u>Tally Lake</u>	No.	1	0	0	1	13	0	0	13
<u>Western Flathead County</u>	%								
<u>Whitefish</u>	No.	13	10	6	29	38	17	9	64
<u>Western Flathead County</u>	%	44.8	34.5	20.7	100	59.3	26.5	14.2	100
<u>Kalispell</u>	No.	6	2	0	8	13	2	0	15
<u>Western Flathead County</u>	%	75.0	25.0		100	86.6	13.3		100
<u>Waylett's, Island Lake</u>	No.	26	19	8	53	192	183	92	467
<u>Fisher River - Wolf Creek</u>	%	49.1	35.8	15.1	100	41.1	39.2	19.7	100
<u>Mill Creek - Divide</u>	No.	185	44	46	275	0	0	0	0
<u>Big Hole River</u>	%	67.3	16.0	16.7	100				
<u>Darby</u>	No.	90	50	39	179 ^{2/}	--	--	--	1
<u>Upper Bitterroot River</u>	%	50.3	27.9	21.8	(225) 100				
<u>Self-Register</u>	No.	--	--	--	8	--	--	--	11
<u>South Fork of Flathead</u>	%								
<u>Deer Lodge</u>	No.								
<u>Cottonwood Creek</u>	%								
TOTAL	No.	415	147	121	737	456	338	188	994
	%	60.7	21.6	17.7	100	46.4	34.4	19.2	100

^{2/} Total includes 46 animals of unknown sex and age.

for all species of big game with the exception of two areas. The Fisher River - Wolf Creek area, which had an extended season on white-tailed deer in 1954, had a total recorded kill of 467 white-tailed deer, which exceeded the total of 317 white-tailed deer for that area in 1953. In the Big Hole River area, the 1954 recorded elk kill of 182 exceeded the 1953 kill of 157 elk.

There is an indication of a trend toward a lighter harvest of the elk in the lower South Fork of the Flathead River area since 1951. In 1951, the elk kill checked there was 484. In 1952 and in 1953 the total checked kill was 433 and in 1954 it was 355. Winter elk counts in the South Fork area over the same period have not indicated a decrease in the elk population. It is probable that some other factor may be responsible for the downward trend of elk harvest in that area.

2. Hunter and hunter trip success.

The number of unsuccessful hunters recorded at each station actually represents unsuccessful hunter trips, for an unsuccessful hunter may check at a station two or more times, each time being recorded as another hunter. Success is therefore expressed as hunter trip success. A very close approximation to hunter success is obtained at Coram and Hungry Horse checking stations where hunters are checked both in and out of the hunting area.

There apparently is a greater tendency for successful hunters to stop at checking stations than there is for unsuccessful hunters. This tendency would have the effect of raising the recorded success ratio above the actual success ratio. However, the hunter trip success ratio, when compared to similar ratios obtained in previous years may serve to indicate trends toward greater or lesser actual hunter success.

It must be pointed out that hunter cooperation may be quite variable and this would have considerable effect on the report of success by the checking stations.

The success ratios in Table II represent hunter success and hunter trip success in killing at least one species of big game.

Hunter success in the South Fork of the Flathead River area was lower in 1954 than in 1953. Since 1951 there has been a trend toward lower success in this area. Although there has been a decrease in elk kill for this area over the same period, it does not follow the decrease in hunter success. As noted in section 1 of this report, winter elk counts have not indicated a decrease in the elk population there. It is quite probable that the decrease in hunter success in the South Fork may be attributed largely to the increasing number of people who hunt there. This increase in hunting pressure is shown in the checking station records for that area from 1951 to 1954.

TABLE II
HUNTER AND HUNTER TRIP SUCCESS ON ALL GAME, 1954

Checking Station	No. of Successful Hunters	No. of Hunters or Hunter Trips	Percent of Success
Coram, Hungry Horse	365	2408 (Hunters) 3619 (Hunter Trips)	15.1 10.1
Bonner	517	1738 (Hunter Trips)	29.7
Swan River	200	1018 (Hunter Trips)	19.6
Tally Lake	15	482 (Hunter Trips)	3.1
Whitefish	96	888 (Hunter Trips)	10.8
Kalispell	40	756 (Hunter Trips)	5.3
Waylett's, Island Lake	549	3398 (Hunter Trips)	16.1
Self-Register	80	560 (Hunters)	14.3
Darby	463	1585 (Hunter Trips)	29.2
Average Hunter Trip Success			15.6

Too few data on hunter or hunter trip success have been collected for other areas to establish definite trends in success.

The variations in hunter trip success between checking stations are probably caused by a number of factors, such as hunter cooperation in stopping at checking stations, species of game in the area hunted and nature of the hunting area (whether timbered or open country, etc.). Some areas are crossed by numerous roads and much hunting is done from cars which would tend to lower the success ratio. It is noted in Table II that the highest success ratios were obtained at the Bonner and Darby checking stations. The areas covered by these stations are relatively easy to hunt when compared to the

other areas. Both have good populations of mule deer, an animal that is considered easier to hunt successfully than either white-tailed deer or elk.

3. Sex and age ratios.

The sex and age ratios as given in Table III are not presented as being representative of sex and age ratios as they occur in the deer and elk herds. Several factors including hunter selectivity and habits of the different sex and age classes of the animals undoubtedly operate to influence the kill so that a ratio obtained from kill data may differ significantly from actual ratios occurring in the game populations. The sex and age ratios in Table III are useful mainly as trend data.

TABLE III

SEX AND AGE RATIOS OBTAINED FROM KILL DATA OR EITHER SEX SEASONS

Checking Station	Species	NUMBER OF ANIMALS								RATIO		
		Male No.	%	Female No.	%	Young No.	%	Total No.	%	Male	Female	Young
Coram, Hungry Horse	Elk	158	44.5	149	42.0	48	13.5	355	100	106	: 100	: 32
Bonner	Elk	63	47.0	50	37.3	21	15.7	134	100	126	: 100	: 42
	W.T.Deer	78	34.4	103	45.4	46	20.2	227	100	76	: 100	: 44
	M. Deer	44	50.6	21	24.1	22	25.3	87	100	209	: 100	: 104
Swan River	Elk	16	25.8	28	45.2	18	29.0	62	100	57	: 100	: 64
	W.T.Deer	56	43.4	33	25.6	40	31.0	129	100	169	: 100	: 121
Darby	Elk	123	53.5	72	31.3	35	15.2	230	100	171	: 100	: 49
	M. Deer	79	42.5	68	36.5	39	21.0	186	100	116	: 100	: 57
Mill Creek, Divide	M. Deer	114	55.9	44	21.5	46	22.6	204	100	259	: 100	: 104
Waylett's, Island Lake	W.T.Deer	174	38.7	183	40.8	92	20.5	449	100	95	: 100	: 50

The percentage of calves in the 1954 elk kill as recorded at Coram and Hungry Horse checking stations is slightly lower than for any year since 1951. This does not indicate any trend toward smaller calf crops in the South Fork of Flathead elk herd as the highest percentage of calves in the kill since 1951 was in the 1953 kill when calves comprised 23.3% of the total checked kill from that herd.

The higher kill of bulls than cows in the South Fork elk herd in 1954 reversed a trend of more cows than bulls killed in the South Fork area since 1951.

Since 1951, female-young ratios obtained from white-tailed deer kill data at Waylett's and Island Lake checking stations have fluctuated between a high of 100:70 in 1953 to a low of 100:50 in 1954.

The female-young ratios obtained at stations other than Coram, Hungry Horse, Waylett's and Island Lake, cannot as yet be used to establish trends as there is not sufficient data from previous years.

During either sex deer seasons, the kill of bucks was greater than the kill of does in most areas, and was only slightly lower in the remaining areas. This fact will be of value in countering the claims of some people that either sex seasons result in "slaughters" of the does.

The age composition of a sample of the harvest of elk from the South Fork of Flathead herd is presented in Table III-A. This is the first time an age classification of this herd has been attempted. Out of the total checked kill, 165 jaws were obtained or a sample of 46.2% of the total checked kill. Jaws were grouped into age classes according to the pattern and amount of wear on all teeth but with emphasis on the molariform teeth in the age classes above $3\frac{1}{2}$ years. While a technique for determining the ages of elk older than $4\frac{1}{2}$ years by dentition has not been worked out to equal in accuracy that developed for white-tailed deer, it is felt that for practical purposes, the method used here would be satisfactory.

TABLE III-A

AGE COMPOSITION OF A SAMPLE OF THE ELK KILLED IN THE
LOWER SOUTH FORK OF FLATHEAD RIVER, 1954

	No. of Animals	Percent of Total	Percent of Total Exclusive of Calves
6 months	19	11.6	--
$1\frac{1}{2}$ years	28	17.1	19.3
$2\frac{1}{2}$ years	28	17.1	19.3
$3\frac{1}{2}$ years	18	11.0	12.4 *
$4\frac{1}{2}$ years	10	6.1	6.9
* $5\frac{1}{2}$ to $10\frac{1}{2}$	57	34.7	39.3
Aged	4	2.4	2.8
	164	100.0	100.0

* $5\frac{1}{2}$ year to approximately 10 year old animals were combined into a single age class because a reliable method of distinguishing these age classes was not available. Aged animals were distinguished by extremely worn molars.

Age class percentages exclusive of calves are given as it is felt that because of hunter selectivity, calves would not be represented in the sample in the same proportion as they occur in the herd.

A rather high percentage of the elk represented in this sample was of the age classes of $5\frac{1}{2}$ thru 10, suggesting a somewhat higher survival rate for these age classes than would be expected. The $1\frac{1}{2}$ year age class seems to be lower than what would be expected. If the proportion of this age class in the sample is representative of its proportion in the herd, then apparently there was a larger than normal mortality in the 1953 calf crop, and as previously noted, in 1953 the percentage of calves in the total recorded kill for the lower South Fork area was 23.3, the highest percentage since 1951.

The age composition of the recorded mule deer kill in the East Fork of the Bitterroot River area is presented in Table III-B. The proportion of deer in the age classes of $3\frac{1}{2}$ years and older is somewhat lower than in the previous year and of those in the age classes $1\frac{1}{2}$ years and fawns is somewhat higher. Whether or not this is an indication of more efficient management of the deer in this area cannot be stated positively at this time, as the data are insufficient to establish the presence or absence of any trend toward increased productivity of the deer.

TABLE III-B

AGE COMPOSITION OF MULE DEER REPORTED KILLED IN THE EAST
FORK OF BITTERROOT AREA, 1953 AND 1954

	1953		1954	
	Number	Percent	Number	Percent
Fawns	17	16.0	35	24.0
$1\frac{1}{2}$ years	35	34.0	54	36.0
$2\frac{1}{2}$ years	25	25.0	29	20.0
* $3\frac{1}{2}$ years +	25	25.0	29	20.0
Total	102	100.0	147	100.0

* $3\frac{1}{2}$ year + class includes all deer aged at $3\frac{1}{2}$ years and older which were combined into a single age class because a reliable method of distinguishing the older age classes of mule deer was not available.

4. Number of hunters per car.

These data were collected to establish indices by which hunting pressure in certain areas may be estimated. It is thought that with such indices, hunting pressure may be estimated quite closely

by using automatic highway car counters. This method of estimating hunting pressure would be of particular value in areas which are not to be covered by a checking station.

TABLE IV

AVERAGE NUMBER OF HUNTERS CHECKED PER CAR, 1954
(Successful + Unsuccessful)

	Week Ends	Weekdays	Average of All Days
Coram, Hungry Horse	2.2	2.1	2.2
Bonner	2.2	2.1	2.2
Swan River	2.1	1.9	2.0
*Tally Lake, Whitefish, Kalispell	2.1	---	---
Average number of hunters per car - western Montana --- 2.1			

* These stations were operated on week ends only.

The data in Table IV indicate that slightly more hunters make up the average hunting party on week ends than on week days. In areas where hunting pressure is heavy, the difference may be of significant value in the estimation of hunting pressure.

5. Residence of hunters.

The source of hunting pressure exerted on an area is important in management planning, particularly in regard to special seasons on game. Some error is introduced by the fact that Montana has used the same automobile license plate for two years during which some hunters undoubtedly changed their residence. However, the error would probably be quite small.

The data in Table V clearly indicate that greatest source of hunting pressure on an area is the nearest large center of population. From the table, it is seen that usually 70 to 85% of the hunters are from one county or, in the case of the Big Hole River area and the Fisher River - Wolf Creek area, from two counties. The remaining 15 to 30% of the hunters come from other counties and each county separately would have little effect on the hunting pressure.

The data for the Blackfoot-Clearwater area are somewhat misleading in that the area is served by several outlets, only one of which is covered by a checking station (Bonner). Powell County is listed as contributing only four-tenths of one percent of the hunters in that area, whereas nearly half of the area is in Powell

TABLE V

RESIDENCE OF SUCCESSFUL HUNTERS IN WESTERN MONTANA AREAS IN 1954

Residence by Counties	South Fork Flathead		Blackfoot- Clearwater		Swan River		Western Flathead Co.		Big Hole River		Fisher River-- Wolf Creek	
	No. of Hunters	% of Hunters	No. of Hunters	% of Hunters	No. of Hunters	% of Hunters	No. of Hunters	% of Hunters	No. of Hunters	% of Hunters	No. of Hunters	% of Hunters
Beaverhead	6	0.2					2	0.1	9	2.0		0.4
Blaine												
Broadwater	14	0.6					14	0.9	1	0.2		0.4
Cascade	6	0.2	7	1.4	1	0.5	2	0.1	8	1.8		
Chouteau	1	0.04					1	0.1	1	0.2		
Custer	14	0.6	1	0.2			1	0.1	2	0.4		
Daniels												
Dawson	2	0.1										
Deer Lodge	3	0.1	2	0.4			5	0.3	205	45.4		
Fergus	3	0.1										
Flathead	1921	79.7	10	2.0	141	70.1	1800	84.7	2	0.4		55.5
Gallatin	2	0.1					4	0.2	6	1.3		
Glacier	25	1.0			1	0.5	35	1.6				1.1
Granite	2	0.1			1	0.5						
Hill	37	1.5			1	0.5	20	1.6	3	0.6		0.8
Jefferson	1	0.04							3	0.6		
Lake	76	3.1	20	4.0	38	19.9	40	1.8	1	0.2		6.7
Lewis & Clark	5	0.2	1	0.2					6	1.3		
Liberty	5	0.2					12	0.6				30.8
Lincoln	84	3.4			1	0.5	76	3.5				
Madison	1	0.04							1	0.2		
McCone	1	0.04										
Mineral	1	0.04	1	0.2			2	0.1				
Missoula	14	0.6	413	80.8	4	2.0	13	0.7	2	0.4		0.7
Park	2	0.1										
Phillips	4	0.1					5	0.2				

TABLE V (Continued)

RESIDENCE OF SUCCESSFUL HUNTERS IN WESTERN MONTANA AREAS IN 1954

Residence by Counties	South Fork Flathead		Blackfoot- Clearwater		Swan River		Western Flathead Co.		Big Hole River		Fisher River- Wolf Creek
	No. of Hunters	% of Hunters	No. of Hunters	% of Hunters	No. of Hunters	% of Hunters	No. of Hunters	% of Hunters	No. of Hunters	% of Hunters	
Pondera	17	0.7					7	0.3			0.5
Powder River	2	0.1			1	0.5	2	0.1	5	1.2	
Powell	6	0.2	2	0.4					2	0.4	
Ravalli	1	0.04	31	6.0					1	0.2	
Richland	19	0.9			1	0.5	2	0.1	2	0.4	0.3
Roosevelt									1	0.2	
Rosebud	9	0.4							1	0.2	
Sanders	6	0.2	3	0.6			4	0.2			
Sheridan	1	0.04					7	0.3			1.1
Silver Bow	1	0.04	3	0.6			8	0.4	178	39.5	
Stillwater	27	1.1					2	0.1			
Teton	7	0.3					6	0.3			
Toole	19	0.8			2	1.0	14	0.1			0.5
Valley	1	0.04			2	1.0	6	0.3	2	0.4	
Wheatland	8	0.3	3	0.6					1	0.2	
Yellowstone											
Non-Resident	66	2.7	13	2.5	4	2.0	1	0.1	9	2.0	0.8
Totals	2422	100.0	510	99.9	199	100.0	2092	99.2	452	99.7	99.7

County and residents of Powell County leaving the area would not pass the Bonner checking station. This is also true of the Big Hole River area but probably to a lesser degree.

6. Deer herd reproduction.

Analysis of the reproductive tracts collected at Waylett's and Island Lake checking stations will be reported by Project W-36-R-5.

The 1954 sample of only 11 complete mule deer tracts from the Bitterroot area was too small and not comparable to the ovarian analyses of tracts from that area obtained in 1953. However, consideration of all aspects of the study of mule deer reproduction in the Bitterroot during 1953 and 1954, tentatively suggested that the reproductive rate has increased in 1954.

7. Mountain goat harvest in the South and Middle Forks of the Flathead area, 1954.

In an effort to obtain more precise data on the harvest of mountain goats in the South and Middle Forks of the Flathead River areas, goat hunter report forms were distributed to hunter camps in these areas prior to the opening dates of the seasons. In the South Fork there were two seasons of 5 days each, beginning on September 15 and October 15. In the Middle Fork, there was one season of 5 days beginning on October 1. A supply of forms, together with stamped, self-addressed envelopes was left at each camp visited. Forms and envelopes were also left at occupied ranger stations with the request that they be given to hunters who did not receive them at their camp. A copy of the form is shown in Figure 2.

In addition to the goats reported by this method, records of other goats killed were received at checking stations and at the Fish and Game Department office in Helena.

Physical characteristics and goats seen data were filed for future reference.

A summary of the mountain goat harvest is presented below:

- 33 goats -- total reported kill
 - 29 goats killed, reported by hunter report forms
 - 4 goats killed, reports from other sources
- 19 goats (65.5% of 29) were males
- 10 goats (34.5% of 29) were females
- 4 goats, sex not given
- 36 - total number of goat hunters reporting
 - 33 - (91.7%) of the hunters were successful
 - 3 - (8.3%) of the hunters were unsuccessful

MOUNTAIN GOAT HUNTER REPORT

The Montana Fish and Game Department needs more information on mountain goat hunting in the South Fork and Middle Fork at the Flathead River country. If you HUNTED mountain goats this season you are urged to fill in the questionnaire below and mail it in the self-addressed envelope. (Several reports of goat hunting from your party could be mailed together.)

1. I killed a mountain goat. Yes _____ No _____ (If answer is no, go to question 6.)

2. Location where goat was killed _____

(give detailed description)

3. Sex of goat killed. Male _____ Female _____

4. Date of kill _____.

5. Length of goat horns _____ inches.

Circumference of horn at base _____ inches.

6. Number of days spent hunting goats _____.

7. Goats seen while hunting: (if none indicate where you hunted)

Location

Number: Adults Kids

<u>Location</u>	<u>Number: Adults</u>	<u>Kids</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____

8. Were any goats wounded that could not be recovered? Yes _____ No _____

If so, how many? _____

9. Remarks: _____

10. Name _____

Address _____
(City) (State)

BY: Montana Fish and Game Department
Box 1138
Missoula, Montana

- 16 - (44.4%) of the hunters were resident of Montana
- 16 - (44.4%) of the hunters were non-resident
- 4 - (11.2%) of the hunters did not state their residence

The 3 unsuccessful hunters were Montana residents.
 22 hunters hunted 55 days to kill 20 goats, an average of
 2.5 days per hunter.
 1 goat was wounded and not recovered.

The total minimum reduction of goat numbers in the South and Middle Forks of the Flathead River area was 34 head. The report forms resulted in many goat kills being recorded that otherwise would not have been reported. There were probably some goats killed that were not reported.

Hunter success was very high, substantiating the belief held by many hunters that goats are relatively easy to hunt after the goat range has been reached.

It is of interest to note that all non-residents were successful, whereas some residents were unsuccessful.

The distribution of the goat kills is given in Table VI.

TABLE VI
 DISTRIBUTION OF 1954 MT. GOAT KILLS, SOUTH AND MIDDLE FORKS
 OF THE FLATHEAD RIVER AREAS

Area of Kill	No. of Goats
White River (South Fork of Flathead)	7
Apex Mt., Danaher Mt. " " " "	4
Three Sisters Creek " " " "	4
Head of Big Salmon, Gordon Creek " " " "	4
Mid Creek " " " "	2
Hahn Creek " " " "	2
Mt. Jumbo " " " "	2
Lewis Creek " " " "	1
Scarface Mt. " " " "	1
Lion Creek Pass " " " "	1
Elk Ridge, Argosy Mt. (Middle Fork of Flathead)	<u>6</u>
Total	34

The distribution of kills indicates that there was not an excessive kill of goats in any area, and the total kill was not excessive for the number of goats estimated to be in the South and

Middle Forks of the Flathead River areas.

8. Dates of game kill in the South Fork of the Flathead River and Swan River.

It was thought that the dates of kill in some areas might be an important factor in management planning. Accordingly, date of kill data were taken on elk in the South Fork of the Flathead River area and on white-tailed deer and elk in the Swan River. The data were tabulated by sex and age classes but as there was no apparent difference in dates of kill for the various classes, the final results list only numbers of elk or deer.

During the first three days of the open season (opening day and the following week end) in the lower South Fork area, 204 or 62.0% of the total recorded kill of 355 elk were taken. Thereafter the kill tapered off rapidly to a low kill on all the remaining days but four for which no kill was reported. There was no increase of elk killed on week ends as usually occurs in areas with more hunting accomplished from roads.

In the Swan River area, the distribution of kill dates of elk was very nearly identical with that of the South Fork area. In the Swan, 42 or 67.7% of the total recorded kill of 62 were taken on the first three days of the open season. Again there was no apparent difference in kill between week ends and weekdays. The number of elk recorded in the Swan was considerably below the number recorded in the South Fork area and the two samples may not be comparable.

The kill date distribution of white-tailed deer in the Swan River area was almost exactly opposite the distribution of kill dates for elk in the same area. Whereas 59 or 95.2% of the elk killed in the area were taken in the first 16 days of the open season, only 3% of the deer were taken. In the last 16 days of the season, 4.8% of the elk were taken and 97% of the white-tailed deer were taken. This situation is probably largely explained by the fact that most hunters prefer to hunt elk early in the season, and take a chance on getting a deer later, and also the either sex deer season did not open until October 31 and extended through the last half of the season. There was an indication of only a very slight increase in deer kills on week ends.

9. Self-register checking stations.

These stations received less use in 1954 than they did in 1953. A comparison of the results is presented in Table VIII.

Although the total kill of big game reported by these stations was small, the data received from them aided materially in estimating the effects of hunting in the areas they were intended to check. The lesser use of the stations made in 1954 is probably the result of fewer hunters using them rather than fewer

TABLE VII

DATES OF ELK KILLS IN THE SOUTH FORK OF FLATHEAD AREA AND OF ELK
AND WHITE-TAILED DEER KILLS IN THE SWAN RIVER AREA
1954

Date	South Fork			Swan				
	No.	Elk Killed	%	No.	Elk Killed	%	No. Deer Killed	%
Oct. 15		117	35.5		19	30.6	0	0
16		47	14.3		21	33.9	0	0
17		40	12.2		2	3.2	1	0.7
18		18	5.6		0	0	0	0
19		6	1.8		2	3.2	0	0
20		10	3.1		1	1.6	2	1.5
21		2	0.6		0	0	0	0
22		5	1.5		1	1.6	0	0
23		5	1.5		1	1.6	0	0
24		7	2.1		2	3.2	1	0.7
25		2	0.6		3	4.8	0	0
26		0	0		0	0	0	0
27		4	1.2		2	3.2	0	0
28		4	1.2		0	0	0	0
29		0	0		0	0	0	0
30		3	0.9		5	8.0	0	0
31		1	0.3		0	0	19	14.4
Nov. 1		12	3.7		0	0	2	1.5
2		2	0.6		0	0	0	
3		4	1.2		0	0	1	0.7
4		3	0.9		0	0	4	3.0
5		4	1.2		0	0	2	1.5
6		6	1.8		1	1.6	7	5.3
7		3	0.9		1	1.6	14	10.6
8		7	2.1		0	0	3	2.3
9		1	0.3		0	0	3	2.3
10		0	0		1	1.6	14	10.6
11		4	1.2		0	0	14	10.6
12		4	1.2		0	0	12	9.1
13		5	1.5		0	0	7	5.3
14		3	0.9		0	0	21	16.0
15		0	0		0	0	5	3.8
Totals		329	100.0		62	100.0	132	100.0

TABLE VIII
COMPARISON OF SELF-REGISTER CHECKING STATION RESULTS
1953 AND 1954

	<u>1953</u>	<u>1954</u>
Number of hunters registered	767	560
Number of successful hunters	121	80
Percent of hunter success	15.8	14.3
Number of elk reported killed	82	58
Mule deer reported killed	35	8
White-tailed deer reported killed	10	11
Mountain goats reported killed	7	4
Black bear reported killed	1	0
Grizzly bear reported killed	2	0
Average number of days hunted by successful hunters	4.5	3.5

hunters entering the hunting area. There is an indication of correlation between the reduced total number of hunters, the reduced number of successful hunters and the reduced kill of elk (the species hunted by most persons entering the area), the reduction in each case being about 30%. However, this may be due to chance and perhaps is not a true correlation.

RECOMMENDATIONS:

1. General Recommendations

Results obtained from the 1954 checking stations have again pointed out the need for reliable and well-trained station operators, and for adequate supervision of the stations. In 1954, an attempt was made to use regular Fish and Game Department personnel on as many stations as possible. This policy resulted in improved efficiency at stations operated by such personnel. However, it may not always be practical to use regular Department personnel exclusively, particularly if a large number of stations were to be operated.

In any event, persons operating stations should be thoroughly informed of procedures used and the reasons for each procedure and type of information collected. Operators should be given as much supervision as necessary to insure the consistently accurate and orderly collection of information.

In the past it has been the practice to ask successful hunters how many days they hunted. Some hunters replied with the total number of days hunted and some with the number of days hunted during the trip on which they were successful. Therefore, it is recommended that all successful hunters be asked the total number of days hunted to bag a particular species of big game.

Should any of the stations operated in 1954 not be operated in 1955, the use of highway car counters in their place is recommended. The use of car counters is also recommended to estimate hunting pressure in areas which have not been previously checked by other methods, and for areas that have not been checked regularly in the past.

In order to fill out the data that are on hand for several areas, the checking stations used in the past should be continued. It would not be necessary for all of them to be operated every year, but a regular schedule of operation for each station should be established.

Methods to increase the use by hunters of the self-register checking stations should be devised as these stations are potentially of substantial aid in obtaining data on game harvests and hunting in areas that are difficult and expensive to check by other methods.

The collection of female deer reproductive tracts should be continued wherever there is a possibility of obtaining a sufficient sample from the deer population.

Deer and elk jaws should also be collected in areas with sufficient kill to provide an adequate sample. The collection of elk jaws from the South Fork of Flathead elk herd should be continued.

Goat hunter report forms should again be distributed to hunter camps in the South and Middle Forks of the Flathead River.

SUMMARY:

1. Checking stations were used between September 15, 1954 and December 3, 1954 to aid in estimating the loss to big game populations due to hunting in western Montana.
2. Checking station operations were supervised by Western Montana Unit big game biologists and game warden supervisors. Individual stations were operated by Unit biologists, deputy game wardens, other Fish and Game Department employees and persons hired as checking station operators by the Fish and Game Department.
3. Twelve conventional checking stations and seventeen self-register checking stations were operated and collected data pertaining to hunter success, source of hunting pressure, number, sex and age composition of kill, distribution of kill, and other factors associated with hunting.
4. The total checked kill of big game was 1161 elk, 737 mule deer, 994 white-tailed deer, 33 mountain goats, 16 black bears and 3 grizzly bears.

5. The average hunter trip success on all game for 8 areas was found to be 15.6%.
6. Sex ratios derived from the kill data, indicated approximately a one to one ratio of males and females. Female-young ratios varied from 100:32 to 100:121. Both sex and age ratios may be considerably influenced by hunter selectivity.
7. Age composition of a sample of the kill of elk from the South Fork of Flathead elk herd indicated a rather high percentage of animals in the age class $5\frac{1}{2}$ to 10 years. The age class $5\frac{1}{2}$ to 10 years made up 39.3% of the sample and aged animals made up an additional 2.8% of the sample.
8. Age composition of the recorded harvest of mule deer in the East Fork of the Bitterroot area indicated fewer animals in the age class $3\frac{1}{2}$ years and older and more animals of the $1\frac{1}{2}$ year age class and fawns than was in the 1953 harvest in the same area.
9. The average number of hunters per car that checked out at checking stations was found to be approximately 2.1. There were slightly more hunters per car on week ends than on week-days.
10. Approximately 70 to 85% of the hunting pressure exerted on the hunting areas originated in the nearest large center of population. In the Big Hole River area, 45.5% of the pressure came from Deer Lodge County and 39.5% came from Silver Bow County. The county seats of each, Anaconda and Butte respectively, are both large population centers of Montana. Both are quite close to the Big Hole area.
11. A concerted effort was made to estimate the total number of mountain goats killed in the South and Middle Forks of the Flathead River areas by using hunter report forms. Results obtained from these forms plus goat kill reports from other sources indicated a minimum kill of 34 goats. Hunter success was 91.7%. About 44% of the hunters were non-resident and all were successful.
12. Sixty-two per cent of the total recorded elk kill in the lower South Fork of Flathead River was taken on the first three days of the hunting season.

In the Swan River area, 67% of the total recorded elk kill from that area was taken in the first three days of the open season. Only 3% of the white-tailed deer reported killed in this area were taken in the first half of the open season.

13. Comparison of self-register checking station results of 1953 and 1954 showed an approximate 30% decrease in their use by hunters.

14. Recommendations for further checking station operations are presented.

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Date January 15, 1955

Approved by:

Name Merle J. Rognrud

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Montana State Department of Fish and Game

By Faye M. Couey, Assistant Director

Wildlife Restoration Division

STATE Montana
PROJECT NO. W-60-R-2
DATE April 15, 1955
VOL. VI NO. 1 & 2

Title of Project: Western Montana Big Game Surveys

Leader: Merle Rognrud

Job Completion Report

Investigations Projects

Work Plan I Job No. I-D

Title of Job: Grizzly Bear Survey

ABSTRACT

Field work on grizzly bear was carried out in the North Fork of the Blackfoot River, the Sun River and Teton River, and the Lower Middle Fork of the Flathead River during 1954. An increase in grizzly density of about 26 per cent was found in the Sun River and Teton River areas since 1941. Density of grizzlies in the other study areas was comparable to that of the Sun River and Teton River drainages. However, the reliability of the density indices and the indicated increase of grizzlies was questioned. Results of 304 grizzly bear questionnaires showed 178 sight reports and 39 kills of grizzlies during 1954. Sex and age composition of the 1953 and 1954 grizzly kills is given. Recommendations for further work are presented.

STATE	Montana
PROJECT NO.	W-60-R-2
DATE	April 15, 1955
VOL.	VI NO. 1 & 2

Title of Project: Western Montana Big Game Surveys

Leader: Merle Rognrud

Job Completion Report

Investigations Projects

Work Plan I

Job No. I-D

Title of Job: Grizzly Bear Survey

PERSONNEL:

Merle J. Rognrud, Biologist, Western Montana Unit
Joe Gaab, Biologist, Southwestern Montana Unit
Robert Neal, Assistant Manager, Sun River Game Range
Phillip B. Marshall, Jr. Biologist, Western Montana Unit

DATES:

Aerial Reconnaissance - May 14, 20, 1954
Field Surveys: North Fork of the Blackfoot River - June 15-20, 1954
Sun River and Teton River - July 8-28, 1954
Lower Middle Fork of Flathead River -
August 19-27, 1954

OBJECTIVES:

To conduct an extensive survey of the distribution and size of the grizzly bear population in Montana. Attempt to develop a satisfactory census method. Determine the status and trend of grizzly bear numbers by comparison with survey work in 1941 and 1942. Incidental to field work to collect scats for a food habit study and to accumulate observations in regard to seasonal movements, mobility and habitat preferences as well as any other life history information.

TECHNIQUES:

Field work in 1954 was concentrated in three areas: the North Fork of the Blackfoot River drainage, the Sun and Teton River drainages and the Lower Middle Fork of the Flathead River drainage (see Map 1). The first two areas are contiguous with each other and with the South and Upper Middle Forks of the Flathead River drainages which were surveyed in 1953. The North Fork of the Blackfoot and the Lower Middle Fork of the Flathead areas had not been surveyed for grizzly bears. The

other areas were surveyed in 1941.

It was planned to use the same method of survey as was used in the 1941 survey of the Sun and Teton River areas (Cooney, 1941) and in 1941 and 1954 surveys in the South and Upper Middle Fork of Flathead areas (Cooney, 1941 and Stockstad, 1954). This method involves the taking note of all signs of grizzlies seen while travelling the area and relating the number of signs to the distance travelled after eliminating as much as possible all duplication of observations. It was also planned to conduct a more intensive survey in the lower Middle Fork of Flathead but several factors (mainly inclement weather) prevented this part of the study. Travel routes are shown on Maps 2 - 5.

Whenever possible, all bear feces were collected and tagged, noting the species of bear involved if known, and the characteristics of the area where droppings were found. This was done to supplement the feces collection of 1953 for a later food habits evaluation.

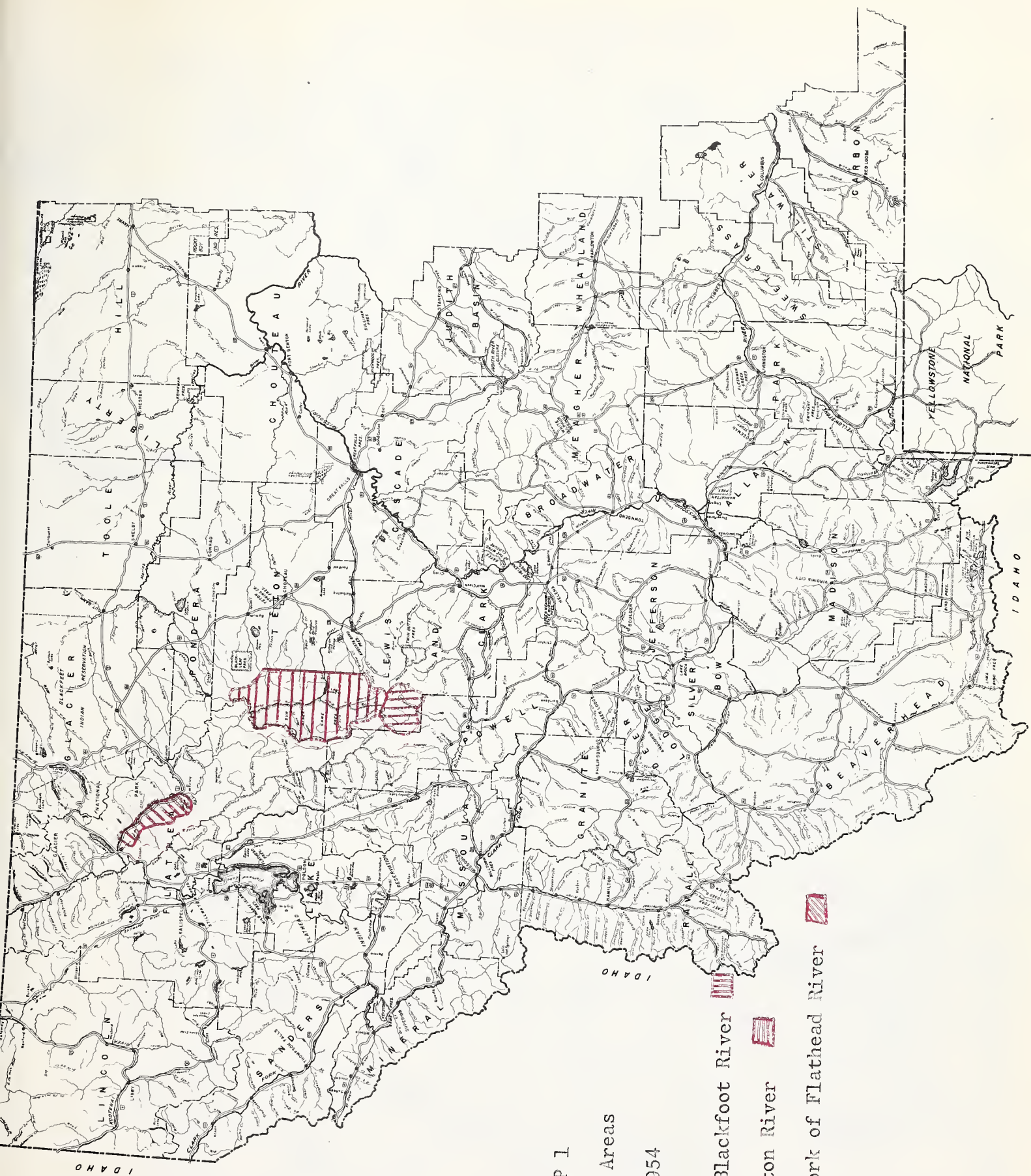
Two attempts were made to locate grizzlies by aerial reconnaissance in May, 1954.

As in 1953, questionnaires were again sent to U. S. Forest Service personnel, guides and packers, taxidermists, predator control agents and Montana Fish and Game Department personnel asking them to report sight observations and kill records of grizzlies in 1954.

FINDINGS:

North Fork of Blackfoot River Drainage

This area was surveyed June 15 through June 20, 1954. Fifty-three unduplicated miles of trail were covered and tracks of four grizzlies were seen. On a miles of travel per bear observation an index of 13.2 was obtained. As this area had not previously been surveyed, no index was available for comparison. However, it compares favorably with indices obtained in 1941 in the South Fork of the Flathead and in 1941 and 1954 in the Sun River areas, both of which are immediately adjacent to the North Fork drainage. The miles per observation indices for these areas are compared in Table I.



MAP 1

Study Areas


1954

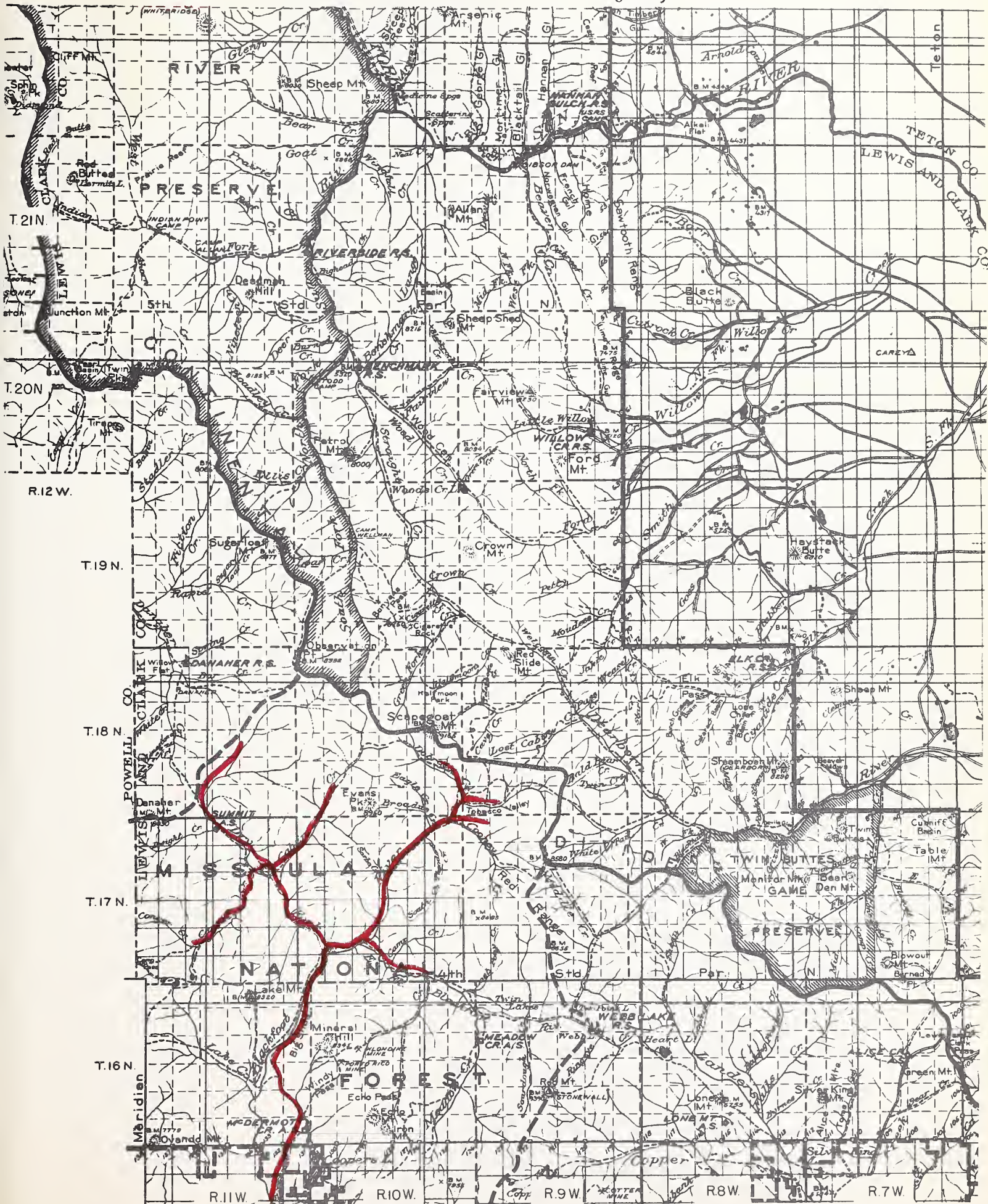
North Fork of Blackfoot River

Sun River - Teton River

Lower Middle Fork of Flathead River

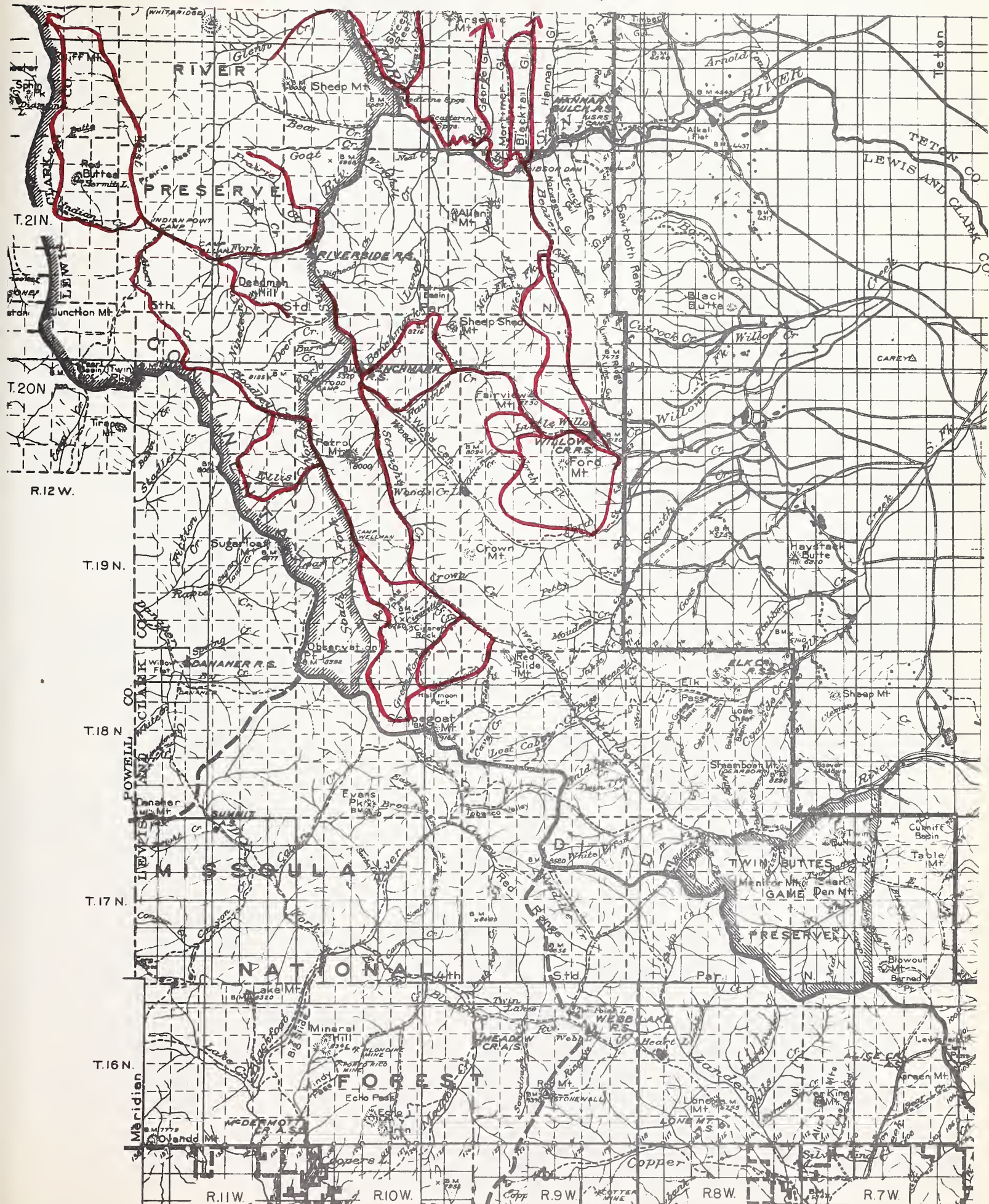
South Fork Sun River Unit

 Travel Routes North Fork Blackfoot June, 1954



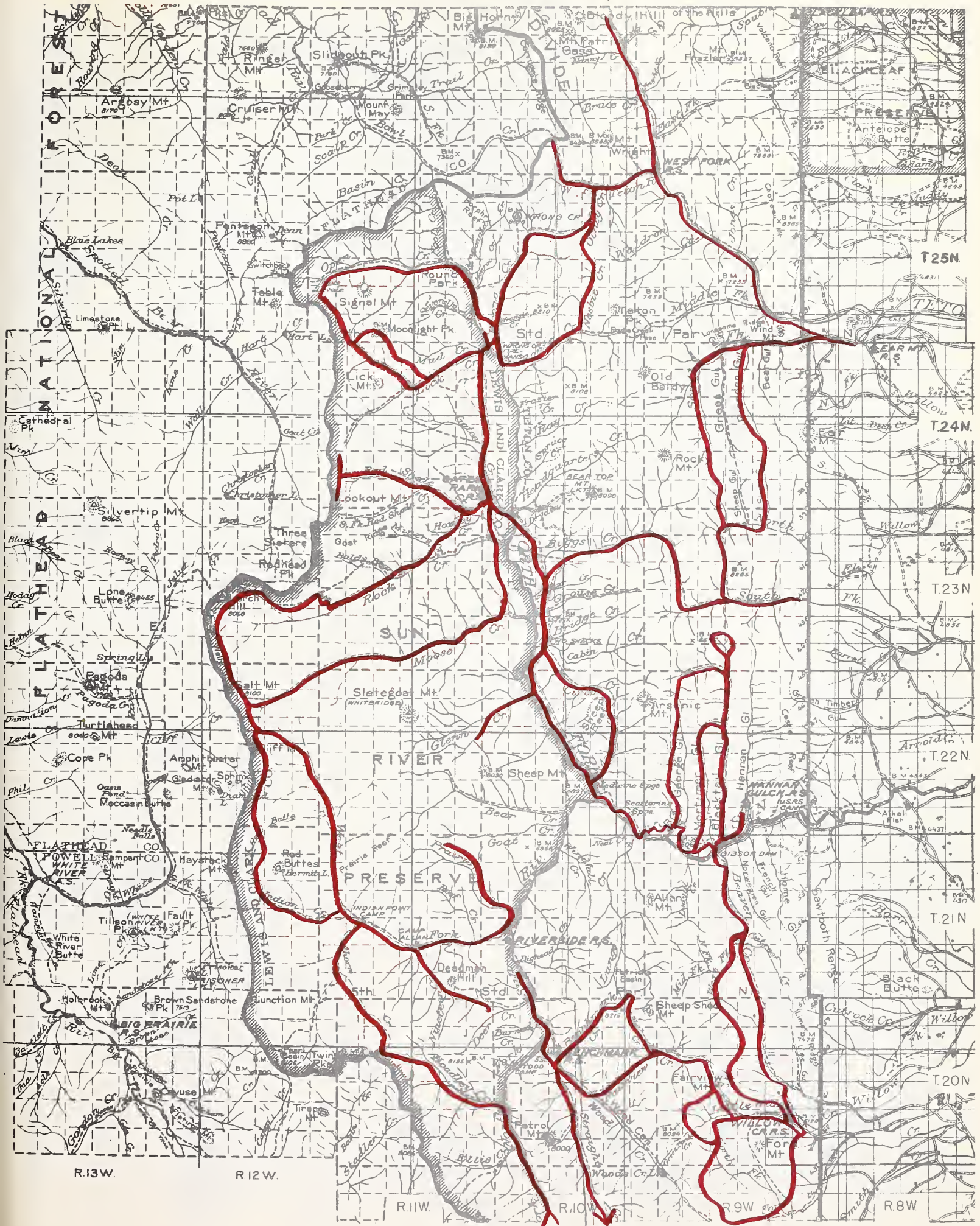
South Fork Sun River Unit

Travel Routes Sun River July, 1954



North Fork Sun River Unit

Travel Routes Sun and Teton Rivers July, 1954 MAP 4



Lower Swan Unit

MAP 5

Travel Routes Lower Middle
Fork of Flathead River

August, 1954

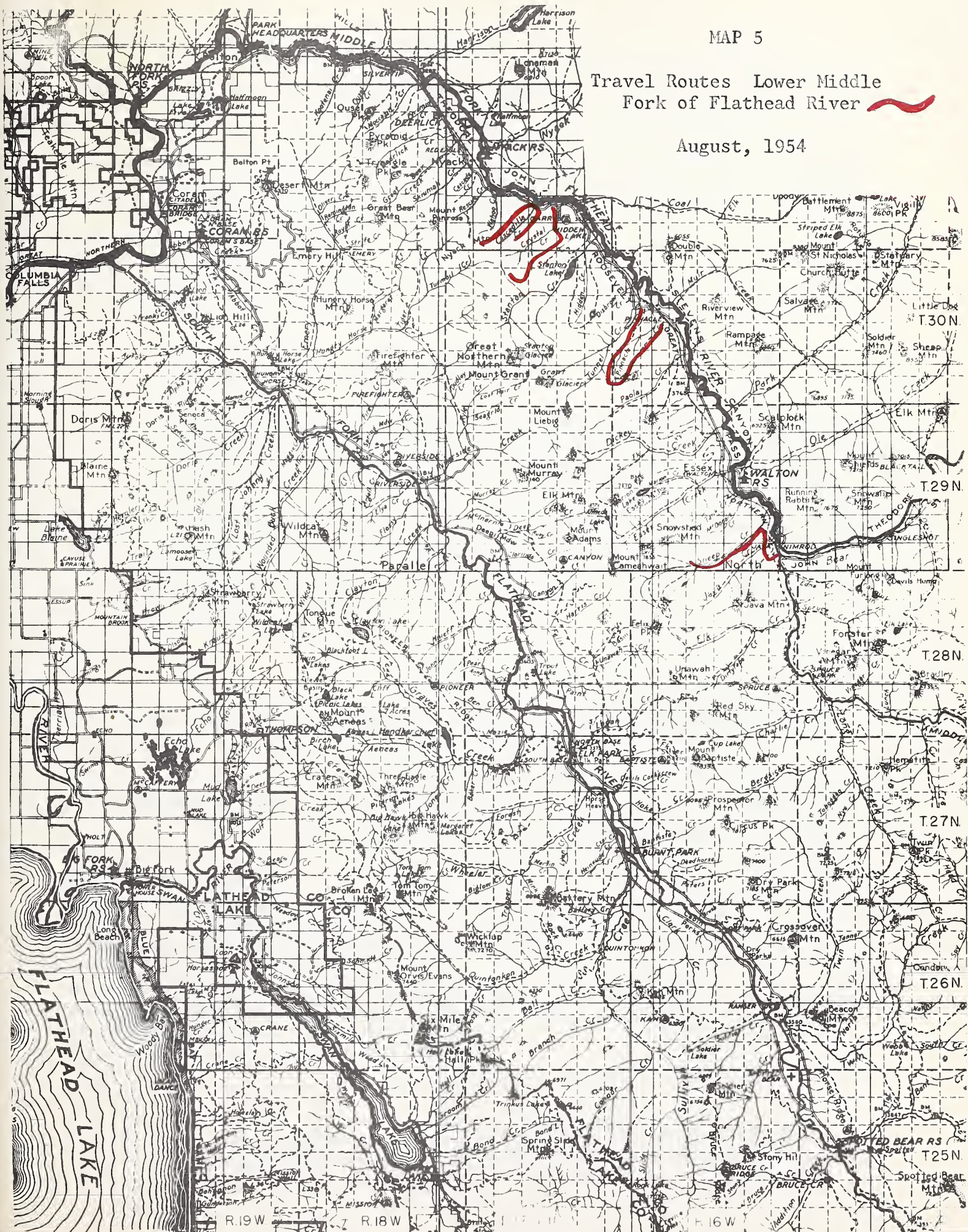


TABLE I

MILES OF TRAVEL PER GRIZZLY BEAR OBSERVATION IN THREE AREAS IN 1941,
1953 AND 1954

Area	1941	1953	1954
North Fork of Blackfoot River	--	--	13.2
Sun and Teton Rivers	15.2	--	11.2
South Fork of Flathead River	17.0	84.3	--

Sun and Teton River Drainages

This area was surveyed July 8 through July 28. Examination of measurements of 41 grizzly tracks indicated 28 tracks of markedly different size and 38 that were considered to have been made by different bears. One bear was seen whose tracks could not be found in the rocky ground. Two other grizzlies were seen and their tracks measured. These are treated as being track measurements only. The total number of bear observations used in calculating the miles per observation index was 39. The data are compared in Table II with similar data obtained in these areas in 1941.

TABLE II

INDICES OF GRIZZLY ABUNDANCE IN THE SUN AND TETON RIVER DRAINAGES IN
1941 AND 1954 FOR COMPARABLE PERIODS

	1941	1954
Total Travel Distance	500	436
Grizzly Observations	33	39
Miles Per Observation	15.2	11.2
Travel Distance Inside Sun River Game Preserve	198	147
Grizzly Observations Inside Preserve	14	19
Miles Per Observation Inside Preserve	14.1	7.7
Travel Distance Outside Sun River Game Preserve	302	289
Grizzly Observations Outside Preserve	19	20
Miles Per Observation Outside Preserve	15.9	14.5

The data indicate an increased density of grizzlies of about 26 per cent since 1941, and also that the increase was considerably greater inside the Sun River Game Preserve than outside the

preserve. If a general increase of grizzlies has occurred since 1941, it would be logical to expect that the increase would be greater inside the preserve as this large area is used far less by man than the surrounding areas. The history of the grizzly in the United States has shown the grizzly, as a species, to be intolerant of human activity.

The surveys of the two years are not strictly comparable in that the summer season in 1941 was considerably more advanced than in 1954. In 1954 there were still large amounts of snow in the high basins under the Continental Divide inside the game preserve. The ground conditions were more favorable for seeing bear tracks inside the preserve which may account in part for the apparently greater increase of bear inside the preserve.

Lower Middle Fork of the Flathead Drainage

This area was surveyed August 19 through August 27. Forty-seven miles were travelled on foot of which 21 miles were unduplicated. Two grizzlies were seen and tracks of one other were seen. The miles per observation index of 7 compares very favorably with similar indices obtained in the other areas surveyed for grizzly bear.

The area though small (about 100 square miles) is reputed to be good grizzly bear country by local residents. The area is used very little by man as it is very rough, travel is very difficult and it lacks the attractions of good hunting and fishing that other areas have.

Aerial Reconnaissance

On May 14 an attempt was made to locate grizzlies by aerial reconnaissance in the Lower Middle Fork of the Flathead River. It was thought that they might be seen on the snow slides that frequently occur in the spring in the area. At the time of the flight, the canyon bottoms and most of the slopes were still snow covered although south facing slopes at lower elevations were bare. All the canyons were searched and one grizzly was seen on a slide in Java Creek.

On May 20 a similar attempt was made in the canyons on the east side of the Mission Range and in the South Fork of the Flathead River. Much of the country was bare except at higher elevations and in protected sites. The South Fork River was flooding the bottom in the highest run off in the history of the river records. No grizzlies were seen.

Grizzly Questionnaire

As in 1953 (Stockstad, 1954), questionnaires were sent to individuals likely to have seen grizzlies or their sign in 1954. A total of 304 questionnaires was sent to U. S. Forest Service

personnel, predator control agents, guides and packers, taxidermists, and employees of the Montana Fish and Game Department. Of the 304 that were sent out, 184 (60%) were returned and contained 178 sight reports and 39 kill reports of grizzlies. The distribution of sight and kill reports is indicated by management units in Table III. Comparison is also made in Table III with the 1953 distribution of sight and kill reports. Locations of 1954 kills are shown on Map 6.

TABLE III
SIGHT AND KILL RECORDS OF GRIZZLY BEARS BY MANAGEMENT UNITS IN
1953 AND 1954

Management Unit	Sight Records		Kill Records	
	1953	1954	1953	1954
Flathead - Sun River	94	118	12	12
Kalispell	18	21	7	9
Kootenai	12	10	2	7
Absaroka	12	5	0	1
Blackfeet Indian Reservation	0	12	4	4
Ennis - Hebgen	8	1	4	3
Blackfoot	7	3	1	1
Bitterroot	5	1	0	0
Gallatin	4	2	0	1
Deer Lodge	3	0	0	0
Clark Fork	2	1	2	0
Big Hole - Monida	0	3	0	0
Madison - Ruby	0	1	0	1
Totals	165	178	32	39

The sight records were not used to denote numbers of bears, but only to indicate the distribution of grizzlies. Sight records should be accepted with reservations as it is sometimes difficult even for experienced observers to distinguish grizzlies from black bears.

There was apparently little significant change in the distribution of grizzlies as determined by the sight reports. The differences in the numbers of reports in some management units are very probably not as significant as they seem, as it is doubtful that the bears reported were actually grizzly bears. This is especially true in the Big Hole - Monida, Deer Lodge and Bitterroot Units. There have been no authentic records of grizzlies in these units for several years.

The recorded kill of 39 grizzlies is thought to be fairly close to the number of bears actually killed. This kill for the State as a whole is probably not excessive if the estimate of about 700 grizzlies in the State is reliable. However, in those isolated areas where there are only a few bears, any kill at all may endanger these remnant grizzly populations.

The composition of the grizzly kills in 1953 and 1954 is shown in Table 4.

TABLE IV
COMPOSITION OF GRIZZLY BEAR KILL IN 1953 AND 1954

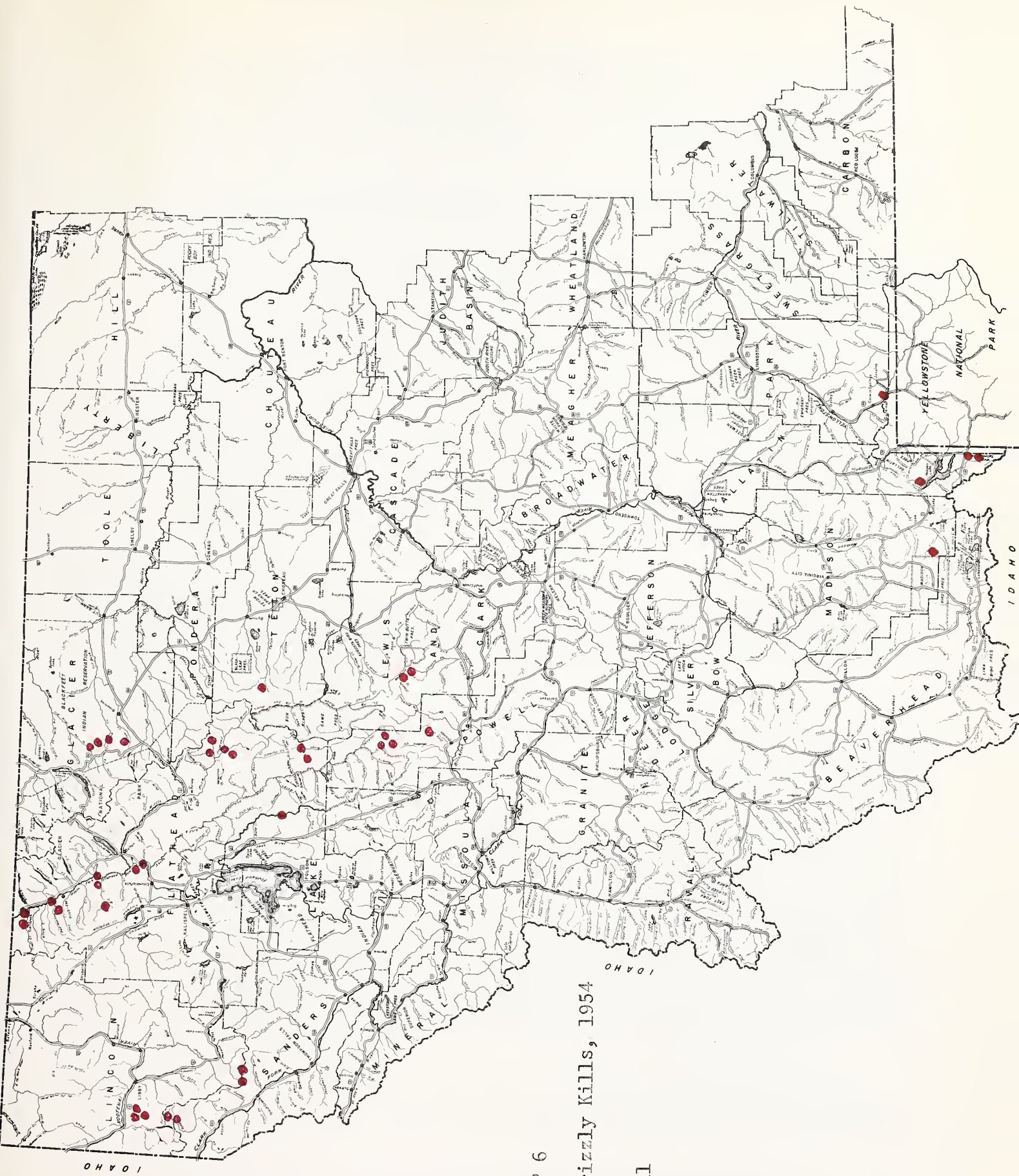
	1953	1954
Adult Male	8	9
Adult Female	9	13
Yearling Male	1	4
Yearling Female	0	0
Yearling (Unknown Sex)	1	4
Adult (Unknown Sex)	8	0
Male (Unknown Age)	1	1
Unknown Sex and Age	<u>4</u>	<u>8</u>
Totals	32	39

These data are presented for the record as they are insufficient to allow any conclusions to be drawn at this time.

CONCLUSIONS AND RECOMMENDATIONS:

Although the data indicate that the grizzly is increasing in the Sun and Teton areas, there is still some doubt as to the reliability of the track measurement method of measuring changes in the grizzly population. While it was apparently successful in the areas surveyed in 1954, it was considered to have failed in the South Fork and Upper Middle Fork of the Flathead in 1953. There are several variable factors that could operate to affect the results of this type of survey such as ground conditions, season of year, availability of forage and the extent of human activity.

To be comparable, these surveys must necessarily be conducted under conditions that are nearly alike each time a survey is made. With so many important and variable factors, it would be very difficult to do successive surveys under closely similar conditions. It is recommended that further surveys of this type not be done until



MAP 6

Locations of Grizzly Kills, 1954

● One Kill

they can be done under closely similar conditions. It may be possible to conduct surveys in the early spring after the bears have emerged from hibernation. At this time, conditions in bear range would be most nearly alike from year to year.

It is recommended that aerial searches for grizzlies be done only to locate bears to facilitate ground investigations.

The grizzly bear questionnaire should be continued in future years. To date, this is the only method available for estimating the annual kill with any degree of accuracy. It is also the only method available for learning the distribution of grizzlies. In future years these data will be of increasing importance in grizzly management.

A complete study of the grizzly bear involving its basic life history is needed to provide the facts so that techniques may be developed for the proper management of this species. Of particular importance would be a knowledge of seasonal territory and mobility of grizzlies which could be determined by intensive work in a more limited area of typical grizzly habitat.

SUMMARY:

1. Summer field work was conducted in the North Fork of the Blackfoot River drainage, the Sun River and Teton River drainages, and the Lower Middle Fork of the Flathead River drainage.
2. Field work, using a track measurement method of survey, was accomplished to duplicate work done in the Sun and Teton areas in 1941 and to use the same method for the first time in the other two areas.
3. The survey results indicated an increase in grizzly density of about 26 per cent in the Sun River and Teton River areas since 1941. Comparative indices for these areas were 15.2 miles of travel per bear observation in 1941 and 11.2 miles of travel per bear observation in 1954. The increase was greater inside the Sun River Game Preserve than outside the preserve. An index of 7.0 miles of travel per bear observation was obtained in the Lower Middle Fork of the Flathead and an index of 13.2 was obtained in the North Fork of the Blackfoot.
4. Aerial reconnaissance on two days in May resulted in one grizzly bear seen in the Lower Middle Fork of the Flathead River.
5. Results of 304 grizzly bear questionnaires showed 178 sight reports of grizzly bears and 39 kills of grizzly bears. Distribution of sight records and kill records was very similar to that of the 1953 sight and kill records.

Composition of the 1953 and 1954 grizzly bear kills is given.

6. Doubt of the reliability of the track measurement method of estimating grizzly bear density is expressed. It is suggested that early spring may be the best time to conduct such a survey. Recommendations are to not conduct these surveys as they have been in the past, to restrict aerial reconnaissance to preliminary work for ground investigations and to continue the grizzly questionnaire in future years.

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STATE Montana
PROJECT NO. W-26-M-7
DATE February 14, 1955
VOL. VI NO. 1 & 2

COMPLETION REPORT FOR
MAINTENANCE PROJECT

As Required By
FEDERAL AID IN WILDLIFE RESTORATION ACT

ABSTRACT OF PROJECT W-26-M-7
1954

The "Game Range Maintenance Through Salt Distribution" project was carried out by essentially the same procedures used in former years. A total of 149,400 pounds of white block salt was distributed on the major elk ranges and some deer ranges in Montana. Airplanes were used to distribute 55 percent of the salt. The Clarks Fork and Flathead-Sun River Units received almost fifty percent of the salt distributed by the project. Inequalities in salt distribution among the management units were apparent when amounts of salt were related to animal units of big game. Adjustments in salt distribution were recommended.

STATE Montana
PROJECT NO. W-26-M-7
DATE February 14, 1955
VOL. VI NO. 1 and 2

COMPLETION REPORT FOR

MAINTENANCE PROJECT

As Required By

FEDERAL AID IN WILDLIFE RESTORATION ACT

1. Title of Project: Game Range Maintenance Through Salt Distribution

2. Personnel: Western Montana Central Montana Eastern Montana

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3. Final Report:

Dates: January 1, 1954 to December 31, 1954

Salt was delivered to distribution points about May 1, 1954. The aerial salting in western Montana took place on May 24, 25, 27, 28, 31 and June 2, 3, 1954. Salt was dropped in the Absaroka Primitive Area on April 26 and June 26. Aerial salting was carried out in the Little Belt Mountains during June, 1954.

Salt was distributed on the ground during the late spring and summer of 1954.

Purpose:

The primary objective of the project is to lessen utilization of

big game winter ranges and problem areas and obtain a more desirable distribution of game on all seasonal ranges. Salt was distributed to decrease the period of winter range use and attract game away from damaged areas, hold big game on summer ranges, alleviate agricultural damage and to bait elk onto formerly unoccupied summer range.

Procedure:

A total of 150,400 pounds of white block salt was available for distribution on big game ranges in Montana during 1954. A little more than half of the salt was distributed by airplanes. The remaining portion of the salt was distributed on the ground by truck and by pack stock of the Department and U. S. Forest Service.

A Ford tri-motor airplane of the Johnson Flying Service in Missoula was hired to distribute 66,000 pounds of salt in western Montana. This airplane carried loads of 3,000 pounds on 23 flights totaling 40 hours and 25 minutes. A Travelair and Stinson airplane were used to distribute 11,300 pounds of salt in 22 hours flying time in the Bitterroot Unit. Light airplanes were also used to distribute 2,400 pounds of salt in the Absaroka area and 2,500 pounds of salt in the Little Belt Mountains.

The plan to attract elk from Yellowstone National Park into the Absaroka Primitive area was continued. Salt was dropped along the Park boundary in April and on summer range within the Primitive area during June.

In the Bitterroot Unit a revision of the salt plan was made. Salt was dropped at low, intermediate and high elevations as the season progressed from May and June into July. During May small drops of 25 pounds each were made at the approximate upper limits of the winter range. The later season drops were 100 pounds each. Location of salt drops was also coordinated with livestock salting in the Bitterroot Unit.

The plan of salt distribution in other areas of western Montana was similar to 1953 and 1952. Aerial salting was more closely coordinated with ground placements in the Clarks Fork Unit, particularly in Mineral County where some revisions in the salting plan were also made. Copies of the aerial salting plan were forwarded to the U. S. Forest Service and Department personnel located in areas of aerial salting in an attempt to improve the coordination of aerial and ground salting everywhere. Copies of the plans, giving locations of salt drops are on file at the western Montana headquarters.

In Sanders County about two tons of salt were placed on the ground to lessen elk and deer damage to agricultural crops. Salt also was distributed near the railroad tracks in Mineral County in an attempt to keep deer off the tracks and away from the switches during the winter. About one ton of salt was used in the Bitterroot Unit to conduct experiments on the value of salt in big game management.

A limited amount of salt was used as bait in big game trapping operations.

Particular attention was given to the location of salt drops in the more accessible areas for later observations in a preliminary evaluation of the salting project.

Findings:

Statewide Distribution of Salt, 1954

The statewide distribution of salt included both aerial and ground placements. The distribution in 1954 amounted to 149,400* pounds of white block salt. A summary of the salt distributed in 1954 is given in the following tables. A discussion of salt distribution by management units is appended to provide a basis for any revision in salt plans and to make recommendations for the project in 1955.

Aerial Salting, 1954

A total of 82,200 pounds of salt was dropped from airplanes. The management unit, date of flight, flying time, area of salt distribution and the amount of salt dropped are given in Table 1.

About one-third of the salt (30,000 pounds) was distributed in the Flathead-Sun River Unit, including 6,000 pounds delivered to Schafer and Big Prairie for ground placements. Other western Montana units received 9-12,000 pounds from the aerial phase of the project. The aerial method permitted salt to be distributed economically on the more inaccessible big game ranges.

Flying time totaled 66 hours and 25 minutes in western Montana. A Ford tri-motor airplane was used in 40 hours and 25 minutes of the aerial salting flights. Flight time in the various management units is included in the tabulation of aerial salting.

* An order of 1,000 pounds of salt scheduled for distribution in the Badger-Teton area was not used.

TABLE 1

AERIAL DISTRIBUTION OF SALT, 1954

Management Unit	Date (1954)	Flight Time		Flight Area	Lb. of Salt
		Hrs	Min-Sub-totals		
Absaroka	April 26	?	?	Yellowstone Park Boundary	1,200
	June 26	?	?	Hellroaring - Slough Creek	1,200
Bitterroot	May 12,				
	13 & 16	9	00	Lower E. & W. Bitterroot	1,300
	June 14	7	30	Medium E. & W. Bitterroot	7,000
	July 17	5	30 (22:00)	High E. & W. Bitterroot	3,000
Blackfoot-Clearwater	May 25	1	25	Gold Creek - Garnet Range	3,000
	25	2	05	Clearwater - N. F. Blackfoot	3,000
	June 3	1	55 (5:25)	Upper Blackfoot - Lincoln	3,000
Clarks Fork	May 24	1	05	Lolo - Petty Creek	3,000
	27	1	25	Fish Creek	3,000
	27	3	35 (6:05)	St. Regis, Plains-Thompson	
				Falls	6,000
Deer Lodge	May 24	1	35	Rock Creek	3,000
	31	2	25	Flint Creek Range	3,000
	31	2	20	East Pintlar Range	3,000
	June 2	1	30 (7:50)	W. Pintlar Range	3,000
Flathead-Sun River	May 27	2	15	South Spotted Bear	3,000
	27	2	00	Big Prairie	3,000
	28	1	20	Schafer (3,000# delivered)	
	28	1	50	Upper Schafer	3,000
	28	1	10	Lower Middle Fork	3,000
	28	1	40	North Spotted Bear	3,000
	June 2	1	45	Big Prairie (3,000# delivered)	
	3	1	20	North Fork Sun River	3,000
	3	1	25	West Fork Sun River	3,000
	3	1	50 (18:35)	South Fork Sun River	3,000
Kalispell	May 28	1	30	East Swan Valley	3,000
	28	1	20	North Fork Flathead	3,000
	28	1	40 (4:30)	West Swan Valley	3,000
Little Belts	June	?	?	Little Belt Mountains	2,500
Totals		62	25		82,200

Ground Distribution of Salt, 1954

The distribution of salt on the ground amounted to 65,200 pounds plus 6,000 pounds delivered to Schafer and Big Prairie by airplane. The distribution is indicated in Table 2 by management units and cooperating Ranger Districts of the various National Forests. A supplemental salt order of 4,000 pounds was distributed in Sanders County adjacent to agricultural lands.

TABLE 2

GROUND DISTRIBUTION OF SALT, 1954

Management Unit	National Forest	Ranger District or Distribution Area	Pounds of Salt	
			District	Unit
Beartooth Big Belt - Boulder	Custer	Meyer Creek	500	500
	Deer Lodge	Boulder	1,000	
	Helena	Townsend	2,000	
	Helena	Helena	1,000	4,000
Big Hole - Monida	Beaverhead	Jackson	300	
	Beaverhead	Lima	500	800
Bitterroot	Bitterroot	East Fork)		
		West Fork)	2,700	2,700
		Darby)		
Blackfoot- Clearwater	Helena	Lincoln	1,000	
	Lolo	Seeley Lake	2,000	
		Blackfoot-Clearwater Game		
		Range	2,000	5,000
Clarks Fork	Couer d'Alene	St. Regis	4,000	
	Kootenai	Plains	2,000	
	Kootenai	Thompson Falls	2,000	
	Kootenai	Noxon	2,000	
	Kootenai	Trout Creek	3,000	
		Mont. F. & G. (4,000# Sanders		
		Co. supplement)		
		Mont. F. & G. (Mineral Co.)	7,000	
	Lolo	Superior	2,000	
Deer Lodge	Lolo	Lolo	2,000	24,000
	Deerlodge	Anaconda	2,000	
	Deerlodge	Butte	1,800	
	Deerlodge	Philipsburg	1,000	
	Deerlodge	Wisdom	400	5,200
Flathead - Sun River	Flathead	Big Prairie(aerial delivery)	3,000	
	Flathead	Schafer (aerial delivery)	3,000	
	Flathead	Spotted Bear	1,000	
	Flathead	Sun River Game Range	2,000	9,000

TABLE 2 (Continued)
GROUND DISTRIBUTION OF SALT, 1954

Management Unit	National Forest	Ranger District or Distribution Area	Pounds of Salt District Unit	
Kalispell	Flathead	Condon	1,000	
	Flathead	Glacier View	1,000	
	Flathead	Swan Lake	1,000	
		Tally Lake	1,000	4,000
Kootenai	Kootenai	Fortine	1,000	
	Kootenai	Libby	3,000	
	Kootenai	Rexford	1,000	
	Kootenai	Warland	2,000	
	Kootenai	Yaak	1,000	8,000
Little Belts	Lewis & Clark	Musselshell	3,000	3,000
Total			67,200	67,200

About one-third of the ground salting took place in the Clarks Fork Unit. The Kootenai and Flathead-Sun River Units received approximately twelve percent each of the salt for ground distribution on the ground. Other units received six percent or less of the total salt distributed on the ground.

A summary of salt distributed by management units and the method of aerial and/or ground placement is given below in Table 3.

TABLE 3
SUMMARY OF SALT DISTRIBUTED, 1954

Management Unit	Pounds of Salt		
	Aerial Distribution	Ground Distribution	Total Distributed
Absaroka	2,400	---	2,400
Beartooth	---	500	500
Big Belt - Boulder	---	4,000	4,000
Big Hole - Monida	---	800	800
Bitterroot	11,300	2,700 ^{1/}	14,000
Blackfoot-Clearwater	9,000	5,000	14,000
Clarks Fork	12,000	24,000	36,000
Deer Lodge	12,000	5,200	17,200
Flathead - Sun River	24,000	9,000 ^{2/}	33,000
Kalispell	9,000	4,000	13,000
Kootenai	---	8,000	8,000
Little Belts	2,500	4,000	6,500
Totals	82,200	67,200	149,400 ^{3/}

- ^{1/} 1,500 pounds experimental salt included
^{2/} 6,000 pounds salt, aerial delivery, included
^{3/} 1,000 pounds salt scheduled at Cut Bank not used

The Clarks Fork and Flathead-Sun River Units each received about twenty-three percent of the salt distributed under the project. The Deer Lodge Unit received eleven percent and other units received about nine percent or less of the total salt distributed in 1954. Airplanes were used to drop 55 percent of the project salt while 45 percent of the salt was distributed on the ground.

Discussion of Salt Distribution, 1954

The total amount of salt distributed under Project W-26-M has increased about twenty percent since 1947. In 1954 the salt distributed was sufficient to supply approximately one pound of salt for each deer and elk recently estimated (1952) in the management units under consideration. Although the estimates of big game populations are admittedly conservative, an approximately proper density relationship should exist between the management unit populations. In order to provide some basis for an understanding of salt distribution within the various management units, a tabulation of estimated deer and elk numbers converted to animal units, together with the amounts of salt distributed is given in Table 4.

Reference to Table 4 shows a total of 36,416 deer and elk animal units estimated in the management units. The amount of salt distributed in 1954 was 4.1 pounds for each big game animal unit. Since most salting was carried out to influence elk distribution, a calculation of salt per elk animal unit was included and found to be 13.13 pounds.

A considerable variation in salt distributed among the management units is seen when related to deer and elk animal units. (Other species of big game were not considered because their relative low abundance would probably have only local effects on the salting project.) The extreme inequity of salt distributed, in terms of elk units, is shown by the range of only five ounces of salt distributed in the Beartooth Unit to 46 pounds of salt in the Kalispell Unit. When experience with cattle has shown a maximum consumption of about two and one-half pounds per month, some revision of the salting project would be desirable.

In order to recommend adjustments in the salting program, it was necessary to prepare some criterion for allotting salt among the management units. The probable consumption of salt by animal units of big game seemed a reasonable basis to recommend maximum quotas of salt for the management units in 1955. In addition several tentative assumptions were made to further guide recommended adjustments in the salting project.

The following tentative statements were listed to clarify objectives of the salting program and qualify derivation of recommended salt allotments:

TABLE 4

SALT DISTRIBUTED BY MANAGEMENT UNITS IN 1947 AND 1954 WITH THE 1952 ESTIMATED NUMBERS OF DEER AND ELK CONVERTED INTO ANIMAL UNITS^{1/} AND RELATED TO SALT DISTRIBUTED IN 1954

Management Unit	Lb. of Salt 1947	Lb. of Salt 1954	Mule Deer		Wt. Deer		Elk			Total Big Game		
			No.	A.U.	No.	A.U.	No.	A.U.	#Salt /A.U.	No.	A.U.	#Salt /A.U.
Absaroka	—	2,400	4,700	940	—	—	1,700	850	2.82	6,400	1,790	1.34
Beartooth	3,000	500	7,800	1,560	370	74	375	187	.27	8,545	1,821	.27
Big Belt - Boulder	6,500	4,000	13,195	2,639	300	60	1,945	972	4.11	15,440	3,671	1.08
Big Hole - Monida	200	800	3,300	660	—	—	706	353	2.26	4,006	1,013	.78
Bitterroot	14,000	14,000	2,550	510	340	68	1,270	635	22.04	4,160	1,213	11.54
Blackfoot-Clearwater	11,800	14,000	9,500	1,900	5,290	1,058	1,855	927	15.10	16,645	3,885	3.63
Clarks Fork	32,500	36,000	9,450	1,890	7,350	1,470	3,015	1,507	23.88	19,815	4,867	7.39
Deer Lodge	3,800	17,200	13,510	2,702	570	114	2,686	1,343	12.80	16,766	4,159	4.13
Flathead - Sun River	18,000	24,000	5,150	1,030	950	190	6,470	3,235	10.20	12,570	4,455	7.40
Kalispell	8,000	13,000	775	155	3,500	700	565	282	46.09	4,840	1,137	11.43
Kootenai	11,000	8,000	7,175	1,435	10,300	2,060	790	395	20.25	18,265	3,890	2.05
Little Belts	5,700	6,500	18,509	3,701	614	122	1,385	692	9.39	20,508	4,515	1.43
Totals	120,450 ^{2/}	149,400	96,614	19,122	29,584	5,916	22,762	11,378	13.13	147,960	36,416	4.10

^{1/} Conversion factor - 5 deer or 2 elk per animal unit.

^{2/} Includes 5,950 pounds of salt distributed in the Gallatin and Madison Units.

1. Salt is distributed to influence big game distribution and movements and not in quantity to supply potential consumption except locally.
2. Salt is distributed primarily to influence elk distribution and movements. Incidental use of salt by mule deer is recognized but except locally or in particular problem areas, salt allotments would not be made in quantity to satisfy the consumptive potential of the deer population. White-tailed deer appear to be least influenced in distribution by salting and allotments would consider only local, problem area consumption by this species. No salt allowance would be made for other species of big game, except locally.
3. Movements of big game would most likely be influenced during the three-month period, beginning in the spring, and salt consumption would decrease over the same period.
4. Salt consumption was assumed to be two pounds per elk animal unit the first two months and one pound the third month of the influence season. A tentative arbitrary allowance of two pounds of salt per mule deer unit was included for the incidental use of salt by this species during the three-month period.

Recommended salt allotments for the management units were based on the 1954 estimate of elk numbers with an allowance of five pounds for each elk unit. An allowance of two pounds for each estimated mule deer unit was also included in the salting allotments. Table 5 below gives the estimated animal units of elk and mule deer by management units and the recommended maximum allotments of salt for 1955.

The recommended salt allotments resulted in a reduction of at least fifty percent of salt distributed in the Bitterroot, Clarks Fork, Flathead-Sun River and Kalispell Units. It would be necessary to revise the salting plans in these areas and other units where reduction in salting is recommended. In revising salt plans, consideration should be given to field experiments to study the effectiveness of salting.

Recommendations:

Table 6 was prepared to indicate the detailed distribution of salt recommended for the 1955 project.

Until full investigations are made locally into the influence of salt upon big game movements and distribution it is recommended salt allotments do not exceed 2,000 pounds for any ranger district or comparable area.

It is recommended that a salting plan and a statement of objectives of salting with some details as to species, local numbers of big

TABLE 5

RECOMMENDED ALLOTMENTS OF SALT FOR 1955 BASED ON ANIMAL
UNITS OF ELK AND MULE DEER

Management Unit	Mule Deer			Elk		Total Salt Allowance	Recommended Allotment of Salt (Pounds)
	1952 Est. No.	1952 A. U.	Salt @ 2#/A.U.	1954 Est. No.	1954 A. U.	Salt @ 5#/A.U.	
Absaroka	4,700	940	1,880	1,125	562	2,810	2,500*
Beartooth	7,800	1,560	3,120	290	145	725	1,500*
Big Belt - Boulder	13,195	2,639	5,278	2,510	1,255	6,275	6,000*
Big Hole - Monida	3,300	660	1,320	600	300	1,500	1,000*
Bitterroot	2,550	510	1,020	2,036	1,013	5,065	6,000
Blackfoot-Clearwater	9,500	1,900	3,800	2,304	1,152	5,760	10,000
Clarks Fork	9,450	1,890	3,780	4,295	2,147	10,735	15,000
Deer Lodge	13,510	2,702	5,404	3,366	1,683	8,415	12,000*
Flathead - Sun River	5,150	1,030	2,060	5,574	2,787	13,935	16,000
Kalispell	775	155	310	510	255	1,275	2,000
Kootenai	7,175	1,435	2,870	1,100	550	2,750	6,000
Little Belts	18,509	3,701	7,402	1,466	733	3,665	5,500*
Totals	96,614	19,122	38,244	25,166	12,582	62,910	83,500*

* Recommended allotments not equal to calculated allowance because quotas were not requested in some management units. Also calculated total salt was rounded out to nearest 1,000 pounds in the column of recommended salt allotments.

game and the problem in general, accompany requests for salt in the future. A standard form could be supplied for applications to be considered until a deadline date. Field investigation of applications could be made when desirable.

Further consideration should be given to improving the salt distribution project. Development of a policy to guide salt distribution would be desirable. Further clarification of salting objectives locally and statements indicating the provisions and limitations of salt distribution would be helpful.

Future salt distribution plans should consider the possibility of field experiments to study the problem of the effectiveness of salting in big game management.

TABLE 6

RECOMMENDED SALT DISTRIBUTION, 1955

Management Unit	National Forest	Ranger District or Delivery Point	Lbs. of Salt
Absaroka	Gallatin	State (Bozeman)	2,500 (aerial)
Big Belt-Boulder	Lewis & Clark	Musselshell	2,000
	Lewis & Clark	White Sulphur Springs	500
	Lewis & Clark	Belt Creek	500
	Helena	Helena	1,000
	Helena	Townsend	2,000
Big Hole-Monida	Beaverhead	Jackson	500
	Beaverhead	Lima	500
Bitterroot	Bitterroot	State (Hamilton)	6,000 (aerial)
Blackfoot- Clearwater	Lolo	Seeley Lake	2,000
	Lolo	State (Missoula)	7,000 (aerial)
Clarks Fork	Coeur D'Alene	St. Regis	2,000
	Kaniksu	Noxon	1,000
	Kaniksu	Trout Creek	1,000
	Lolo	Thompson Falls	1,000
	Lolo	Plains	1,000
	Lolo	Lolo	1,000
	Lolo	Superior	2,000
	Lolo	State (Missoula - 6,000)	6,000 (aerial)
Deer Lodge	Beaverhead	Wisdom	500
	Deerlodge	Anaconda	2,000
	Deerlodge	Philipsburg	500

TABLE 6 (Continued)

RECOMMENDED SALT DISTRIBUTION, 1955

Management Unit	National Forest	Ranger District or Delivery Point	Lbs. of Salt
Deer Lodge (Continued)	Deerlodge	State (Missoula, 3000) (Deer Lodge, 6000)	9,000 (aerial)
Flathead-Sun River	Flathead	State (Kalispell, 6000) (Missoula, 3000)	9,000 (aerial)
	Lewis & Clark	State (Augusta)	6,000 (aerial)
	Lewis & Clark	State (Augusta)	1,000 (game range)
Kalispell	Flathead	Glacier View	1,000
	Flathead	Swan Lake	500
	Flathead	Tally Lake	500
Kootenai	Kootenai	Fisher River	1,000
	Kootenai	Fortine	1,000
	Kootenai	Libby	1,000
	Kootenai	Rexford	1,000
	Kootenai	Warland	1,000
	Kootenai	Yaak	1,000
Little Belts	Lewis & Clark	State (Stanford)	2,500 (aerial)
Sub-total			78,000
Experimental Salt (Missoula)			4,000
Experimental Salt (Kalispell)			4,000
Experimental Salt (Bozeman)			<u>4,000</u>
Total Salt			90,000

Summary:

1. Project W-26-M "Game Range Maintenance Through Salt Distribution" was carried out during the spring and summer of 1954.
2. The purpose of the project was primarily to reduce grazing pressure on major elk winter ranges and some deer winter ranges.
3. Salt was available for distribution after May 1, 1954, and distributed according to salt plans by airplanes and on the ground by trucks and pack stock.

4. A total of 149,400 pounds of white block salt was distributed in 1954. Airplanes were used to drop 55 percent of the salt and 45 percent was distributed on the ground.
5. About one-third of the salt distributed by airplanes was dropped in the Flathead-Sun River Unit.
6. The Clarks Fork Unit received about one-third of the salt distributed on the ground.
7. The Clarks Fork and Flathead-Sun River Management Units each received about twenty-three percent of the total salt distributed by the project.
8. The amount of salt distributed in 1954 was a 20 percent increase over salt distributed in 1947.
9. The salt distributed in 1954 amounted to approximately one pound for each elk and deer estimated in the management units under consideration.
10. Salt distribution related to animal units of deer and elk amounted to about four pounds for each animal unit estimated in the distribution areas. Each animal unit of elk received about thirteen pounds of salt in 1954.
11. Consideration of salt distribution in the management units showed inequalities when amounts of salt were related to animal units of big game.
12. A revision of the salting project was recommended in which the amount of salt to be distributed was based on an allowance of consumption by animal units of elk and mule deer.

Submitted by:

Name Merle Rognrud

Date Feb. 14, 1955

Approved by:

Montana State Fish and Game Department

By Faye M. Couey, Assistant Director

Wildlife Restoration Division

